

Jim Coulson

SUSTAINABLE USE of Wood in Construction



WILEY Blackwell

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*'I think that I shall never see
A poem lovely as a tree'*
Joyce Kilmer (1888–1918)

Contents

<i>Preface</i>	xi
<i>Acknowledgements</i>	xix
1 Some Things You Should Know About Wood, Trees and Forests	1
1.1 Some basic information on how trees grow	1
1.2 Basic tree types – softwoods and hardwoods	3
1.3 The properties of timbers	5
1.4 Different forests and tree types	6
1.5 Rate of growth	7
1.6 Natural forests	8
1.7 Managed forests: Conifers	12
1.8 Managed forests – broadleaves	16
2 The Concept of Being ‘Sustainable’	25
2.1 Being sustainable: A definition and a target	25
2.2 What can we do to help?	28
2.3 Using the forest resource: The economic argument	33
2.4 Legal harvesting	35
2.5 The Timber Trade Federation: Introducing its responsible purchasing policy	37
3 Voluntary Timber Certification Schemes	41
3.1 Some further details on the RPP	42
3.2 Checking legality – I: The Corruption Perceptions Index (CPI)	44
3.3 Checking legality – II: FLEGT	50
3.4 Going beyond FLEGT: MYTLAS	51
3.5 Checking legality – III: Other ‘legality’ certification schemes	52

3.6	Checking sustainability: Chain of Custody Certification	54
3.7	FSC and PEFC as Chain of Custody Certifiers	57
3.8	Other Chain of Custody Certification bodies	61
3.9	UKWAS	62
3.10	Third-party assurance	62
3.11	How Chain of Custody schemes operate	63
4	The UK Government and European Regulations: Legally Trading in World Timbers	65
4.1	Checking up on the checkers: The role of CPET	65
4.2	CPET's help with legality and sustainability requirements	66
4.3	Legality and sustainability: The UK government's definitions	67
4.4	Legal timber sources – the UK government's definition	67
4.5	Sustainable timber sources – the UK government's definition	68
4.6	Category A and Category B – 'Proof of Compliance'	68
4.7	Current and future supplies of certified timber	70
4.8	The EUTR: Europe's new and compulsory 'timber legality scheme'	71
4.9	The meaning of 'due diligence'	73
4.10	Satisfying the EUTR	74
4.11	Who actually needs to obey the EUTR?	81
4.12	The 'first placer on the market'	81
4.13	CE marking and the CPR	82
4.14	CITES: What exactly is it?	83
5	Specifying Sustainable Timber for Any Project: Some Important Dos and Don'ts; With a Bit More About Wood	89
5.1	Using wood in a sustainable way	90
5.2	The government's Timber Procurement Policy (TPP): A brief reminder	91
5.3	Certificates	91
5.4	What if I can't get the timber I want?	94
5.5	The use of recycled timber	96
5.6	Insisting on a particular Chain of Custody 'brand' for your certified timber	97
5.7	Deciding which wood to use	99
5.8	Some of wood's other characteristics	105

6	Some Principal Softwoods Used in Construction in the UK: With Their Main Properties and Sustainability Credentials	109
7	A Selection of Hardwoods Used in the UK: With Their Main Properties and Sustainability Credentials	125
8	Re-use of Timber and Wood Products: The Carbon Cycle, End of Life Disposal and Biomass	155
8.1	The true 'carbon cycle'	156
8.2	End of life disposal of timber and wood-based products	158
8.3	Recycled timber	158
8.4	Disposal of timber in landfill	159
8.5	Burning wood: Fossil fuels versus biomass	160
8.6	Biomass	162
9	Energy Considerations and Construction Materials	167
9.1	Embodied energy	168
9.2	Cradle to grave analysis	171
9.3	Cradle to cradle	172
9.4	BREEAM	173
Appendix 1	Terms, Abbreviations and Acronyms Used in This Book	179
Appendix 2	Timber and Wood Products: Some Helpful Organisations	185
	<i>Index</i>	187

Preface

I am starting to write this timber book in exactly the same location where I completed the writing of my last one: in the Caribbean. I must assure you, Dear Reader, that I'm not showing off, it just so happens that with the first book, I was scheduled to be on holiday at the same time as I was trying to finish it – and Barbados was a very relaxing place where I could get away from work and the distractions of everyday life. But then – lo and behold! – I was once again on holiday at the very time that I needed to begin working on this next book.

In 2012, my (hopefully helpful and informative) work: *Wood in Construction: How to Avoid Costly Mistakes* was first published. That book aimed to clarify much about the correct specification of timber and the most common wood-based materials, and also it attempted to kill off a few old wives' tales along the way. So I am now following up that book with this one, which I hope will be thought of as a sort of companion to – or perhaps an extension of – the earlier book.

In this new one, my intention will be to show how wood really can claim to be the 'miracle' material of the twenty-first century (as if it wasn't pretty good before). Because not only is wood a very strong, highly attractive and extremely versatile material in its own right; it is undeniably also – when properly grown, sensibly and well looked after – *the* one material on the planet that is completely and infinitely renewable. And, miraculously, it is at the same time an extraordinarily useful 'store' of atmospheric carbon; for the whole of its lifetime in our service.

Wood grows on trees (obviously). But perhaps more correctly, I should say it grows *in* trees, since it is the primary wood tissue (known as 'xylem') which makes up the majority of the overall volume of any individual tree. Xylem forms the entire trunk (and

of course, the branches too) of every single tree on this planet. Trees are, essentially, nothing more or less than fairly complex, 'woody-stemmed' plants. In other words, the trunk (or as we wood scientists prefer to call it, the *stem*) of any tree is made from the stuff that we know as wood; and which we trade commercially under the term 'timber' – or if you live in North America, it is called 'lumber' (no matter)

It is well known that the vast majority of plants, by their very nature and form, can be 'planted' by mankind and so they can be grown on, to any level of maturity as long as they survive. And, so long as they are placed into a more or less half-decent soil, with some sort of nutrient content to it, and are then allowed to grow up in whichever type of climate suits them best – warm or cold, wet or dry – then any plants can more or less thrive. Then – with the right amount of care (which in some cases may be minimal) – many, many plants can of course be harvested and used: for food, for fuel, for their fibre, for their oil, or whatever. And that principle, in a nutshell (or perhaps I should say, in a tree-trunk), is the key to the whole concept of the *sustainability* of wood as a material that we can, and indeed should, use. So it is my earnest philosophy that we all need to carry on using wood: and the more, the merrier.

That's because wood – when looked after in the right way – is basically no more or less than a crop, which needs to be harvested: in the same way that we can (and do) harvest wheat, potatoes, sugar cane or rhubarb; to name but a few examples. It is true that the timescale may be a little longer with trees than it is with those various and aforementioned food crops, but you might be surprised to know that it's not all *that* much longer, in a good many instances. Of course, it will very much depend upon the particular species or variety of tree that we might choose to grow, and the particular circumstances under which we are able to grow it. But my point here is that we need not necessarily wait for a hundred years or more – as so many people seem to think we must – when it comes to getting some useful timber from our trees. Nor do we have to always involve a second or third generation of humanity, after planting any individual tree, before we can fully reap its benefits: although, in a way, that is perhaps one of the great appeals of timber, at least in the popular imagination: the idea of leaving something of ourselves there for the future.

So in this book, I hope to show you first of all how wood 'works' (at least in the most basic and simple sense). And after that, my aim will be to show you how it is becoming much,

much easier to specify and use timber and wood-based products in construction, without having to worry so much about whether or not you are doing anything 'wrong'. So please, let me reassure you all – Mr Architect, Mr Engineer, Mr Builder, (and yes, even Mr DIY-er) – that you *can* happily specify, design and use this 'wonder material' that comes to us, courtesy of trees. And you can do so again and again and again, *ad infinitum*, because wood is indeed the nearest thing we have to an infinite resource.

As we go forward into a perhaps less certain future on this planet of ours; we need to capitalise on the reality of wood's renewable-ness, and then we can also capitalise on that wonderful fact more and more, for the present and the future benefit of this planet that we all live on.

My first wood book was not, in any real sense, an 'academic' textbook; although it did contain some rather essential elements of 'wood science' which I felt were important for understanding some of the later stuff that I then went on to write about. And please be reassured: you needn't worry unduly about this new one, this book seeks to be even less 'wood sciency' than the last one, although I will still need to cover a few matters of importance, about what wood *is* and what trees *are*, just so that you don't get too confused along the way. But then I hope that you will better understand why certain things are as they are; and why maybe they can't be altered too much, even if we should wish to try to do so (although, in the best traditions of predicting the future, I'm bound to be wrong about that claim, sooner or later!).

I have been studying wood for a very long time, about two-thirds of my whole life, in fact. And in that span of around 40 years, I have witnessed an amazing amount of progress in the way that timber is specified and used. But at the same time I have seen, in some other ways, a considerable amount of wasted – or maybe I should say, misdirected – effort in the manner in which the care of the world's forests has been highlighted or emphasised. Many of those forests have in fact been pretty well looked after for a long, long time (although in some places, I do admit, they have not been so well looked after, in more recent times).

I have also seen some – let us say, misguided – efforts from some of those who would wish others to use wood more 'wisely'. I have personally either seen or heard at first hand, instances where the 'environmentalists' have sometimes insisted upon practices that have not always (in my own

opinion) been most productive, or most conducive to winning the co-operation of those whom they were seeking to influence. But more of that later in the book.

I have also witnessed some of the ways in which those who have responsibility for the forests (their 'stewardship' as some like to say) have really taken that responsibility very seriously and in a number of examples, have been doing so for around two centuries. And that's long before any of the present-day 'green' attitudes became either fashionable, or politically sensitive. (Ah, but then I have been fortunate to have been able to see things on a more global scale; rather than just the narrow, parochial, and – I'm sorry to have to say – fairly typically *British* way of looking at things.)

Let me explain that last comment a bit.

In this country (and by the way, if you are a reader from elsewhere in the world, please accept my apologies for seeming to exclude you; it's nothing personal. I'm writing this book essentially from a UK perspective, and thus primarily for a UK readership) it appears to me that we – the British, that is – seem to have the view that everything we say, do or experience *must* be more or less the same for everyone else in the world. That attitude (some might say, 'worldview') is very much bound up in the British psyche, I believe. It's the sort of outlook that used to be called 'jingoistic' – and, although the word has been more or less deprecated since the days of Empire, it seems that some of the basic attitudes in this country have rather carried on as they were, regardless of the fact we are in a new millennium (and some might even say, in a new reality).

In my own not inconsiderable experience, I have been very aware of a tendency for the UK-based 'defenders' of wood to react somewhat unfavourably to its continued, and apparently unlimited, use (that is, they often express great caution and worry about anyone using any sort of wood for anything at all, and bang on all the time about 'saving trees') as though the whole world were in exactly the same position as ourselves, vis-à-vis the availability of timber ... but happily, a lot of the rest of the world isn't just like us.

Here in the UK we have a relatively limited stock of woodland, of any sort and that's primarily because we also have a pretty limited stock of the necessary countryside to grow those woodlands (or should I say forests) on. As a nation we are a huge nett *importer* of timber and wood-based products, to the tune of somewhere around 70 per cent of our total requirements. And because of that reason, it somehow seems as

though we cannot get our collective national head around the fact that many other countries in the world might actually still have an awful lot of useful wood knocking about in *their own* forests. Surplus wood, that is. Wood that is spare and available for export. In other words, there are places which have ‘renewable’ wood, harvested from forests that have been stable, and growing, *and* ‘sustainable’ for a very long time. Enough for all of their future generations to keep on growing and making a living from, in fact.

I first became involved with the UK timber trade in the early 1970s: around the time that the first ‘oil crisis’ struck the developed world; and that was long before anyone was using the term ‘sustainability’ in any meaningful or widely-publicised sense. But luckily (for me) even back then I had very good contacts with the North American wood industry – which was still a major source of imported timber in those days (especially from Canada). I also had a very good relationship with the Scandinavians (mainly the Swedes and Finns), who had themselves by then been exporters to the British Isles for something over 500 years. (All right, you pedants: I know that Finland, as a separate country, isn’t 500 years old ... but that part of the world, whatever it was called back then, had been exporting ‘Baltic red-wood’ to England since about the mid-fifteenth century.)

Canada and Scandinavia have been major sources of sawn timber and wood-based boards (as an aside, this latter entity consisted mostly of plywood in the early part of the twentieth century, since there was no OSB, and not a huge amount of chipboard, even as late as the 1970s when I was newly ‘into’ wood-based panel products) exported to the UK, for several generations. And both of those timber-producing regions have had policies of ‘renewable’ forestry in place for well over a hundred years, and back then, in the nineteenth century, there was certainly no FSC or the like, to stir things up.

In order for you to understand the concept of what those exporting regions were doing all that time ago – and without any outside prompting or political pressures from the ‘green’ lobby – think of the old saying ‘selling off the family silver’, except that for the word ‘silver’ read ‘forests’, and for the word ‘family’ read ‘nation’. So it shouldn’t then take too much imagination to realise that a country which is rich in forests (and very often, such countries are not rich in too many other things); but which also has a relatively small population, would see those forests as a vital source of income and foreign exchange. And that being the case, why then would they willingly cut

down all of those trees for short-term gain and so leave themselves with nothing for the future? Of course they wouldn't, would they?

Well... yes and no – and it all depends upon where you're talking about, and exactly when things changed in certain places, from basically good to more or less bad. But then, we largely have world politics to blame for that more recent state of affairs. Most 'developed' nations with large forest areas (such as Canada, Sweden and so on) behaved – and continue to behave – really well, as I have just touched on, a few paragraphs earlier. But unfortunately, many of the 'young' and often newly-independent nations, who were also in possession of large, natural forests (and, as it happens, those were mostly *tropical* forests) very soon fell prey to political turmoil and corruption and so the 'ideal' of managing their nation's forest resources for their own economic future somehow got lost, corrupted or abandoned, or at best, seriously derailed for quite a long time.

Therefore, just like the proverbial curate's egg, the story of forest conservation and sustainability right around the world is, as they say, 'good in parts'.

By and large, the 'Westernised' nations had already put in place very effective policies to conserve and expand their forests. But the 'developing' nations – who had often possessed quite significant and workable forestry policies, many of which had been put in place when they were part of someone else's Empire – all too often fell into corrupt ways; and thus allowed their forest practices to seriously deteriorate for a regrettably long time. Happily, that process of mismanagement and decline eventually changed – at least in many of those places – and it is still changing and improving today of course.

Now then, all of the foregoing background information (or 'ramblings' as you might call them) brings me back to the main point and purpose of this book: I want to provide some basic information about where our uses of 'traditional' woods came from; but then I want to bring things up to date and explain what's happening nowadays in the world of wood, especially with regard to forest management attitudes. And along the way, I'd like to unravel some of the myths, but then also explore the facts; and then I will check out the regulations that have sprung up, ever since the timber trading world turned 'Green'. That last landmark was – as far as I can dimly recall – sometime in the late 1970s or early 1980s: which was, as far as the timber trade was then concerned, perhaps a little bit later than in many

other aspects of everyday life, but then, that's rather typical of the timber trade in all things.

Matters are still changing and evolving of course, even as I write this, so maybe it's best that you should regard this volume as less of a definitive textbook, but more of a sort of 'position paper' as to what's going on here and now. It aims to point out where we've come from and then to point the way that things seem to be going, as far as I can presently see. And I should also advise you that it is very much my own 'take' on things, and so the opinions in it (as opposed to the many facts which are also included) are very definitely my own and no-one else's. However, this book is most certainly intended to be helpful and encouraging and I am striving to get it as up-to-date as I can manage to make it, at a time when we are in what seems to be such a constantly-changing regulatory environment.

My overriding purpose is that I want to leave you with the absolutely positive feeling that it's not just 'OK' to be thinking about using wood. I want you to *know* that specifying and using timber and wood-based products – and hopefully, using even more timber than you already do – is actually beneficial for all of us who live on this planet. Well, I've made a (fairly lengthy!) start; and I've set out my stall in no uncertain terms, so now I'd better get on with it!

Jim Coulson
Holetown, Barbados

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1 Some Things You Should Know About Wood, Trees and Forests

Of course, to better understand wood and so be equipped to specify it and use it correctly for most construction purposes, you should really read my earlier book (*Wood in Construction: How to Avoid Costly Mistakes*). But even if you simply want to know how and why you should be using this remarkable and unique material in a 'sustainable' way, then you will still need to know a few essential facts about how trees grow; and what basic types of trees there are; and then what they might reasonably be used for. So that is the real purpose of this introductory chapter: to 'set the scene' on timber and its origins, before I then go on to explore the complexities of how and why we can – and indeed should – all seek to act 'sustainably' when it comes to using timber.

1.1 Some basic information on how trees grow

I said in the Foreword that trees are essentially plants that can be harvested, and that's true. But whereas most plants which we regard as crops have a fairly short 'rotation' time – measured in weeks or months, depending upon soil and climate – trees are a bit more *permanent*, one might say.

They grow with a 'woody' stem, which is of course, the tree trunk; and that's what we mostly use, in terms of what the tree gives us, out of its material products (there are also oils and resins and so on, but 'wood' is of course by far the biggest 'ingredient' that we get from a tree). That stem, or trunk, can



Figure 1.1 The ‘woody stem’ of a tree allows it to remain standing for many years.

remain upright for years and years; and thus it allows the tree to constantly develop and expand, which it does by the process of adding new layers of growth directly on top of all the previous, older ones – instead of the stem dying back every year and then the whole plant needing to be replanted in order that the next ‘lifespan’ of a single-season crop can grow up anew.

In this way – by that very clever, and yet simple, expedient of just not dying back every year – trees can be more or less ‘permanent’. And it is this very permanence as a plant which makes trees so highly useful to us. By evolving as they have done, with this more or less ‘long-lasting’ and rigid trunk, trees have thus inadvertently provided mankind with a highly versatile material (their wood, of course) that we can use for all sorts of things. And we can indeed do lots of clever stuff with wood, thanks to its fantastic range of properties, which sets it apart from just about all of the other structural and decorative materials that we could employ.

You may perhaps be aware that wood’s primary ingredient is cellulose, which is a complex molecule whose elements are

hydrogen, oxygen and carbon (and thus it is known to chemists and biologists as a 'hydrocarbon'). Just by its very act of growing, a tree naturally draws huge amounts of carbon out of the atmosphere, by converting harmful carbon dioxide (CO_2) and harmless water (H_2O) into the much more complex material $\text{C}_6\text{H}_{10}\text{O}_5$; which is what cellulose essentially is.

And from that relatively basic formula – depicting that wonderfully 'simple-but-complicated' chemical reaction within the tree – it should then become apparent that the more we can use wood, and also the more we can keep wood in service within our buildings, our furniture and so on; then the more 'used-up' CO_2 we can keep locked away and thus out of harm's way, so far as our planet is concerned. (By the way, this process of locking away atmospheric carbon is known, rather grandly, as 'sequestration' and there are formulae for calculating how much carbon we can sequester, by using wood and by growing more trees, but I'll deal with that in a later chapter.)

So much for the inherent chemistry of wood (which I have greatly simplified here, but you get the idea, I hope). Yet it is a fact that this wonderful chemistry helps us, without too much effort on our part, to reduce the amount of carbon dioxide in the atmosphere, all the while that we are specifying and using timber and the various wood-based products it can be turned into. But to do your part of the work properly and without running into too many difficulties, it would be helpful for you now to understand a bit more about the fantastically varying *types* of trees that you can find in the world, and to know a little more about how they differ from one another.

1.2 Basic tree types – softwoods and hardwoods

I have of course explained these terms in much greater detail in my other book, but for now, let's just say that you need to be aware that those two rather simple-sounding names, if used just on their own, are really no great help to you at all.

That is because the so-called 'softwoods' are not particularly soft (and nor are they useless, or weak, or anything else that you might associate with the term 'soft'). And the so-called 'hardwoods' can quite often be anything but hard; and by no means are all of them particularly strong, or particularly long-lasting. And nor do they necessarily have all – or

sometimes, any – of the other attributes that you might think were associated with the term ‘hard’.

It is another common misconception about timber and trees, that ‘hardwoods’ will usually take many decades or even centuries to grow; and can thus achieve a great age, whereas ‘softwoods’ are believed to grow far more rapidly and to live shorter lives and then die off much sooner. But the picture is altogether much more complicated than that – almost the reverse in fact – as I shall explain in a bit. So you should certainly accept that those apparently easy words ‘softwood’ and ‘hardwood’ are very misleading terms; and they really only mean one single thing that you can be sure of, in relation to a tree which bears such a title. And that is the *type* of tree which that timber (whatever species it may be) comes from.

Very simply put, ‘softwood’ timber comes from the trunk of a *coniferous* tree; whereas ‘hardwood’ timber comes from the trunk of a *broadleaved* tree. And that’s about all you can say with any great certainty, because the various properties of any individual timber can vary widely from one species to another; and those properties will not usually be linked in any direct or meaningful way, to whether or not the tree in question was called a ‘softwood’ or a ‘hardwood’.

So what do we actually need to know about our timber, if those very common terms don’t really help us much?



Figure 1.2 The typical needle-like leaves and cones of a ‘softwood’ tree.



Figure 1.3 The typical 'broad leaves' and fruit of a 'hardwood' tree.

1.3 The properties of timbers

There are a great many individual properties of any timber that it would be helpful – I would even say vital – to know about, in order to use it correctly. Things like density, strength, texture, resistance to decay, movement in response to moisture, and so on. Properties which, when fully understood, should enable timber and wood-based boards to be specified and used without any major problems. But all of those individual properties are not things which I plan to discuss in any huge detail here; important though they are, although I will touch on some of them in a later chapter when dealing with the correct specification of any 'sustainable' timber.

However, if you are keen to find out some very specific information in greater detail, about the particular properties of wood as a material – and that's something which I certainly believe you should indeed know a lot more about – may I now respectfully refer you to my previous book?

However, even in the more limited context of 'sustainability', it is at least worthwhile to gain an understanding of the ways in which tree growth can vary – and it can vary quite considerably, depending very much upon which type of tree is grown where. Even the rapidity – or maybe the slowness – with which any individual tree grows (a process we normally refer to as its 'rate of growth') will depend upon quite a range of different

factors; which I will look at more closely in a short while. Before that though, I'd like to explain a little more about which trees tend to grow naturally in which places, since that will help you to better understand how mankind's actions within both the 'natural' and the more 'man made' forest areas have had, and will continue to have, an impact on the present and future availability of this huge and highly renewable resource.

1.4 Different forests and tree types

Softwoods (that is, conifers) have tended, through evolutionary adaptation, to favour the world's colder areas and thus they make up the vast majority of what is known as the 'boreal' or northern forest area of our planet. This huge natural phenomenon stretches across the northernmost parts of the globe, from the northern USA and Canada across to Scandinavia, the Baltic States and Russia, although it does not extend up into the Arctic Circle, since nothing very much in the plant world can really grow there. However, softwoods also grow throughout much of the northern temperate zone – that is, in much of Europe, large chunks of Asia, and large areas of the rest of the USA – and they especially like to grow in the more mountainous regions, where altitude provides a temperature profile that is quite similar to the world's more northerly latitudes.

We can find conifers in the southern hemisphere as well; although in commercial timber trading terms, those that we do see are nearly all northern hemisphere species which have been grown in plantations (of which, more anon). To all intents and purposes, there are no commercially-significant conifers which are native to the southern hemisphere; and there are no great numbers of conifers found naturally in the tropics either, and certainly not in commercial forestry terms, at present.

Hardwoods (that is, broadleaves) on the other hand, tend much more to prefer warmer – or often very much hotter – climates in which to flourish. The only hardwoods that you are likely to find growing in amongst the conifers of the northernmost boreal forest are fairly small and almost 'weedy' specimens of the more hardy species: such as alder, aspen and birch. For the typical examples of mature, majestic oak trees and the like, you will need to look a bit further south – in the temperate forests of Europe, Asia and North America, where the generally

milder climate there is considerably more suitable to their evolutionary temperament.

And, of course, there are also hundreds (well, thousands, really – but certainly hundreds in commercial terms) of species of tropical hardwoods which – as you can tell from the very terminology – grow quite happily in some of the very hottest and most often humid climates on earth. Indeed, there is virtually no country in the tropics (apart, perhaps, from a few coral atolls) which does not have some greater or lesser natural population of tropical trees. These native species of trees can be – and frequently have been – used as a local timber resource; and to a larger or smaller extent, for commercial production; and occasionally for export as well.

If you want to see where the hardwoods and softwoods primarily come from, in a world context (and in very ‘broad brush’ terms), then turn to the beginning of each of the chapters about those timber types, later in this book.

1.5 Rate of growth

It should by now be fairly obvious that these various climatic and geographical conditions of growth will, of course, have a marked effect on the growth rate of different tree species: be they softwoods or hardwoods, growing either in completely separate regions, or – as in the case of large parts of the northern temperate forest areas – living together quite comfortably side-by-side and sharing the same sorts of soils and weather conditions.

And yet, even with these apparent similarities in their growth conditions, it is surprising how varied the growth rates of neighbouring, but different, tree species, can be. Or, on the other side of the same coin: how trees of the same species can vary their growth rates quite markedly, depending upon their individual circumstances of location, soil and weather.

I am often being asked questions like, ‘How long does a tree take to grow?’ Or, ‘How old can a [you can insert your own favourite tree name here] tree get, before you should cut it down, or before it simply dies of old age?’ And the answer to all those sorts of simple-sounding questions is, ‘It all depends’. Now, I’m not being deliberately evasive here, it really *does* depend upon a huge range of factors, so I’ll need to start unravelling that somewhat vague and unhelpful answer in stages.

A few paragraphs ago, I gave a fairly quick sketch of the world's forest types, starting with the most northerly and ending up in the tropics. But even within those larger (and quite generalised) forest regions, there are some pretty big differences. And to explain this whole concept in a readily understandable way, I will concentrate on the softwood forests first of all; since they illustrate quite nicely most of the variations that I want to show. And I'll start off by looking at trees which grow in so-called 'natural' forests.

1.6 Natural forests

Take a country like Sweden, for instance. It's very, very long, and it spreads from a southern latitude somewhere about on a level with Newcastle upon Tyne and then extends right up into the Arctic Circle. [I was told by one Swedish forester of my acquaintance that if one could rotate Sweden, using its southern tip as the pivot – somewhere about Malmö, let's say – then the top of the country would end up about on a level with the bottom of the boot of Italy – so Sweden is a *very* long country indeed!]

And being so 'long' from bottom to top, it means that the climate in Sweden can be very different as one travels up-country from south to north. In fact, you will find oak trees growing in the south of Sweden: so it's not all pine and spruce forests in that part of the country (I nearly said 'in that neck of the woods ...') by any means. But for the present example that I need to illustrate, let's concentrate on what happens with regard to just the pine and spruce trees, in the different forest conditions that pertain throughout this very extended country.

In southern Sweden, a typical pine or spruce tree will reach harvestable diameter in about 60–70 years. (By the term 'harvestable diameter' I mean to say, somewhere around 30–50 centimetres, depending upon the taper of the tree trunk. And it is this diameter which suits the input requirements of most modern softwood sawmills). But those same types of trees will take well over a hundred years to reach even the lower limit of that diameter range, when they are grown in northern Sweden, so that's 30 centimetres – if you're lucky – in about 120 years. I saw this for myself, at a sawmill near to the small town of Peteå (pronounced 'Pee-Tee-Oh'), which is located on a latitude not terribly far from the Arctic Circle.



Figure 1.4 A very fast-grown softwood from a forest area with a long growing season.

I went there in early October a few years back and I found that the ground had already frozen as hard as iron, and the first flakes of snow were falling. I had the luxury of something around four hours of daylight – if what I experienced could actually qualify as ‘daylight’ – from about 10.30 in the morning until about 2.30 in the afternoon – before darkness fell again. The trees that the local sawmill was processing were really quite small; in fact, some of them looked to be not much bigger than saplings: but in reality they were already over one hundred years old! Yes, it’s true – those trees had experienced a hundred years’ worth of growing, but only for a maximum of around four months per year: that is from about the middle of May, when the ground first unfreezes, to about the middle of September, when the sunlight starts to get scarce and darkness falls rapidly in a scant few hours.

Yet in the meantime, their ‘conifer cousins’ down south, around Malmo, had been enjoying just about double that annual growth rate: from early March right up until late October ... so that’s why those trees could grow more wood tissue in 60 years in the south, than the ones in the north could manage to grow in over a hundred years.

The story is very much the same in eastern Canada, too. In Ontario, the softwood trees (which are other, different species of pines, spruces and true firs) can grow much, much faster down around Toronto and in the Niagara Peninsula (as that



Figure 1.5 A very slow-grown softwood from a forest area with a short growing season.

part of southern Ontario is known) than they do up in the north of Quebec Province. For instance, in the charmingly-named settlement of Chibougamau (which is pronounced ‘She-booga-moo’ in the Québécois dialect), situated right up in the far north of Quebec, there is a solitary sawmill, which is known, delightfully, as ‘Les Chantiers de Chibougamau’. This – the most northerly of sawmills – processes many spruce and fir logs of a remarkable *eight* centimetres in diameter (yes, I did say eight): and yet those trees are a minimum of one hundred and twenty years old.

But it’s not just the temperature which causes such differences in growth rate; and it’s not just the amount of sunlight, either; although both of those things are certainly factors. It is also – most significantly – the overall length of the growing season: in other words, the total amount of actual daylight that the growing trees receive each year, during their long, long lives. Experiments have shown that trees seem to have an inbuilt genetic programme that is much more finely tuned to the overall season than it is to anything else in their natural environment.

I was talking to my Swedish forester colleague about this; and he told me that they had actually tried the rather singular experiment of taking seedlings from each extreme

of the country – north and south – which thus related to either a very short overall season or a much longer season, respectively – and then planting them in their exact opposite locations. In other words, they planted northern seedlings in the milder south, and southern seedlings in the harsher north. And what happened? Those seedlings from the north were, it seemed, ‘tuned’ to maintain slow growth, so, despite having a much longer growing season, more sunlight and better temperatures, they still grew for only a limited part of the year, as though they were still ‘up north’. And the southern seedlings didn’t fare much better, but for the opposite reason. They reacted as though they were still in a region where daylight was more plentiful and went on for longer and they tried to grow even when conditions wouldn’t permit it. And so they died off, killed by the winter frosts, when they were still ‘tuned’ for further growth. It seemed that all of the other ‘cues’ – such as the temperature of the air and the freezing soil at the end of September – didn’t affect them enough to stop them effectively killing themselves by continuing to try to grow, due to their inbuilt or ‘programmed’ growth pattern.

That is why – in Sweden at least (which is a place whose forestry policies I can report on with reasonable accuracy, from first-hand experience) – the tree nurseries, which ‘grow on’ seedlings for re-planting in the forests, have to use their



Figure 1.6 Selected conifers in a Swedish tree nursery, encouraged to branch, and so produce thousands of cones and millions of seeds every year.



Figure 1.7 Individual conifer seeds being 'potted up' in the tree nursery: they will be planted out in the forest as seedlings, after about three years.

seed-stock only from relatively 'local' specimens; and they cannot generally use seed stocks from elsewhere – even though those may be of the same tree species and in fact from the same 'political' country – if they come from too far north or south.

Now, having mentioned the production of seedlings and their replanting, that brings me rather neatly to my next category: managed forests.

1.7 Managed forests: Conifers

Managed forests are, essentially, not so very different from natural forests, but with the added 'ingredient' that someone (generally either a government department, or a private forest management company) has intervened in some way, to modify the natural growing cycle, to clear away any unnecessary undergrowth and clutter, or to stimulate better growth in the native species by means of improved forest practices. And sometimes – but by no means always – they may introduce a non-native species as well, although this latter intervention is normally reserved for plantations (I will say more on this third forest type, in a while).

Depending upon the level of intervention, managed forests could be seen as a sort of ‘halfway house’ between natural forests and pure, newly-created plantations. Although just how far either side of that notional ‘halfway’ mark any particular managed forest actually sits, is very much dependent upon the precise level of intervention that may be desired, or that may have been achieved in practice.

In the case of Sweden (which as I say, I know quite well, and which is not untypical of the majority of Scandinavian and European forestry operations, in my experience), their native forests have been very well managed for about 200 years, or even longer, if one takes into account the more informal and less structured practices of farmers and smallholders, prior to the greater ‘internationalisation’ of the timber trade.

I mentioned earlier about seeing trees being harvested in the far north of Sweden, which were one 120 years old: and I can be quite precise about that, because the foresters told me that what I was watching being harvested was not – as I first of all believed it to be – a virgin forest (though it looked quite like it, to my less practised eye). It was, in reality, the resultant ‘crop’ which had been planted in the late 1880s by their great-grand-parents’ generation. So that particular forest had in fact been managed for more than 150 years, before I ever got to see it. (And I will say it again, that was long before there was any modern-day ‘clamour’ for such an environmentally-friendly thing as ‘sustainability’.)



Figure 1.8 A well-managed forest, harvested for a second time after 120 years of re-growth. Note that not *all* the trees have been felled.

I said a while back that we in the UK tend to think (quite wrongly) that other countries have exactly the same attitudes to things as we do, and that our peculiarly British 'take' on things is assumed to be universal, the world over. And certainly, many of the people that I talk to in this country have no concept of the Swedish (and indeed, other countries) principle of simply leaving a large area of forest to re-grow for over a century, before they have a need to come back and then do something with it. That sort of process is tantamount to 'crop rotation' on a scale which is unimaginable from the British perspective! But then, when you have a country with an entire population that is less than that of London, yet with a land area two or three times as great as the British Isles, which is mostly covered in trees, that sort of forest management is much easier to do!

And of course, it's not only Sweden which can do it. Latvia – in the Baltic States – is about the same size as the Netherlands, and yet it has only around two and a half million inhabitants; whilst its land area is just over 50 per cent covered in trees. Germany – which is a more recent large-scale exporter of wood to the UK – is also on record as claiming that they have more trees growing in their managed forests than Sweden does. So really, we shouldn't worry too much about where our softwood requirements will come from in the future, because the timber is already there, and it's getting more and more, every year.

To complete my story about managed conifer forests, and using the Swedish example, I just need to explain the philosophy behind the process. The way they have achieved their harmonious blend of 'old' and 'new' forest is by allowing a mix of natural regeneration – that is, seeds falling to the soil directly from selected trees of good genetic stock, which had been deliberately left standing during the felling operation – plus some quite considerable replanting, with (literally) millions of new seedlings; also taken from genetically selected stock, which was known to be suitable for the exact forest region which it was destined for. These seedlings had been grown on in the forest company's own tree nurseries for about five years, before being planted out by hand (or I should say, mostly by foot), using a veritable army of students during their summer vacation, with each person being required to plant out, on average, *one thousand* trees per day. So that's the way in which you get back all of the trees which you have cut down to use ... and of course many, many more millions of trees as well.



Figure 1.9 Typical regeneration in a previously-harvested Canadian forest (Photo courtesy Canadian Forest Service).

The picture is pretty much the same in the forests of all the other 'Westernised' or 'developed' countries – and certainly it's like that in all of those countries who export reasonable volumes of softwood timber, with reasonable regularity, to the UK. These are: Germany, Austria, Sweden, Finland, Latvia, Canada and the USA. In all of these countries, their managed forests are all replanted on the basis of at least 'three-for-one', that is, three mature conifer trees are grown up again, for every one tree that is cut down for use. In actual fact, the method is typically to plant *five* seedlings for every single tree that's harvested, so that, after two 'thinning' operations (which is a process whereby the weaker or more misshapen specimens are cut out after 10 to 15 years, and then again after another similar time interval, to allow space for the more healthy ones to grow to maturity), three really good trees remain in the forest for the future. The basic process is simple, but very effective and not ever so hard to carry out in practice, when there is a will to do so. By now

you should understand that we're definitely *not* going to run out of softwoods any time soon, that's for sure.

1.8 Managed forests – broadleaves

I need to say a little bit here about the hardwood forests, before I start to sound too complacent about the world's supply of wood, based solely on the rather good and healthy situation vis-à-vis the conifer forests.

1.8.1 Temperate forests

Of course, most of the countries that I was just referring to above also have their native populations of temperate hardwoods, too. And those temperate species of broadleaved trees, in those 'Westernised' countries, are also being grown in managed, commercial forests, although not usually so intensively as with the conifers. For example, in the Appalachian mountains of the eastern United States, the management of their stocks of native hardwoods is pretty well organised: and once again, that has been the situation for well over a hundred years.

Here in the UK, we also import a very high percentage of all the hardwoods that we use (although the precise percentage varies, depending upon the particular species). But take oak for example: we do import sizeable quantities of that timber from the USA (of both red and white oak); and we also import European oak from France, Denmark, Romania and – to a lesser extent – Germany. But once again, the British view about the availability and use of hardwoods is somewhat coloured by our own experience and our somewhat narrow, parochial and 'domestic' view of the world. Even though oak trees do still grow here in the UK, we don't now have enough of it to really satisfy all of our demands for that particular wood. And yet it is still a very popular timber, never really seeming to go out of fashion, so its lack of 'local' or 'domestic' availability hasn't stopped us from wanting to use it. Once again, if we looked at the bigger picture, we would see that the world as a whole is not going to run out of oak, just because *we ourselves* don't seem to have very much of our own to write home about, so to speak. There's actually plenty of oak growing in the temperate forests of the world, but just not very much of it here at home (I blame Nelson!).



Figure 1.10 A well-managed and ‘sustainable’ temperate hardwood forest in the USA (Photo courtesy American Hardwood Export Council).

1.8.2 Tropical forests

The situation with regard to tropical hardwoods is a bit more complicated, however. Not because the tropical forests themselves are very much more complicated (though they are a bit more so); but because there is so much political ‘baggage’ tied up with them, too. I hinted, in the Foreword, that all had not been well in the tropical timber world for some time and that was very largely tied up with matters relating to post-independence problems, political in-fighting and corruption in many of the nations that had previously been quite ‘stable’ under their former colonial rule, of whatever style and nationality.

Now I’m not defending the colonies in any way, and it is a fact that some not very good things happened during those times, but one of the good things that actually *did* happen back in the colonial days was the creation, in many of those colonised countries, of a highly-organised administration with a good and well-run civil service. And amongst the things that

such a civil service did very well – and much better than the ‘locals’ – was to manage the country’s natural, wealth-creating resources – including its forest resource – in a much more efficient way; with proper licensing of felling operations and well-controlled programmes of tree planting. Of course, not everything was rosy; but by and large, the forests in a lot of those tropical countries were pretty well managed until things fell apart, after they got their independence, in a good many of those places. And it has taken, in some cases, half a century or more to get things running again more or less normally; so that matters are just about back to where they were in the 1960s, so far as forest management is concerned, at least in some of those ex-colonial countries, if not everywhere in the tropics.

The other difficulty with managing tropical forests, as opposed to temperate ones, is that the different tree species do not naturally grow together in large stands, as they usually tend to in North America or Europe. Instead, most tropical species naturally grow at a very low population density of only one or two specimens per hectare, with trees of many, many other – quite unrelated – species surrounding them. And that can make the harvesting of only a few ‘target’ species, without harming any of the remaining trees, somewhat tricky.

I don’t intend to go into great detail here about the various techniques that are used to extract individual tree species from tropical forests; but suffice it to say that that is one of the factors which can make it very much more difficult to achieve some sort of forest certification in that part of the world; as opposed to the more straightforward procedures that are generally used for the temperate forests.

And that is perhaps one of the prime reasons why the tropics have become much more popular in more recent decades, as ‘hosts’ for plantations (or ‘crops’, effectively); and which consist of only a single tree type which can then be harvested much more easily. And that now means it’s time I talked a bit about this last type of highly productive forest – the plantation.

1.8.3 Plantations

A pure ‘plantation’ – as opposed to an augmented, or additionally-planted but essentially managed forest – will generally be found in a region or area where forests were not found before – or at least, where they had not been found growing naturally for some considerable period of time.

Plantations are generally easier to manage than existing forests (either natural or managed) and they are also far easier to spot; since they usually consist of large numbers of trees of a single species (or at most, two or three species of similar character, such as Sitka spruce and Norway spruce) that are of a very uniform age and size. Therefore, they don't really look much like 'forests' at all, even though they may bear that title. Plantations of all shapes and sizes can be found all over the world; and of pretty much all types of forest, in more or less any topographical environment: temperate and tropical; mountain and valley; coast and interior. They may consist of conifers or broadleaves, and of native or non-native species (sometimes both), although most commonly, they will consist of 'introduced' (or 'exotic') trees. The reasons for this last, and perhaps slightly puzzling, phenomenon are at least twofold.

First of all, climate tends to play quite a big role. Notwithstanding what I said earlier about the effects of seasons and daylight hours, growing in a milder climate than the trees were typically used to 'at home' will generally encourage a faster growth rate in any non-native tree. (Perhaps it thinks it's on holiday?). And secondly, the very fact of being planted in a different soil, and yet being grown alongside others of its own kind, seems to act as a stimulus to many of these exotic species; and so their growth rate will very often speed up, thus producing larger-diameter trees much sooner than we might otherwise expect.

And there is a third factor, which is nothing to do with whether or not the species being grown in any plantation is a native tree species to that country or not.

Because the trees in the plantation are effectively all the same as one another – in terms of type, age, genetic attributes, and so on – they will, as soon as they are planted out, start to compete directly with one another for the available sunlight. And as a result of this 'competition between equals', they will boost their growth as much as they possibly can, since the tallest trees will naturally get the most access to the food-producing energy of the sun. If, as a tree, you are short and slow-growing, it will mean that your neighbours will simply shade you out until you just wither away. So the one thing that all plantation-grown trees have in common, and the one thing that marks them out as being quite different from trees grown in natural or managed forests, is their habit of reaching quite sizeable diameters in a relatively short span of years. And that can be both a blessing and a curse.

It is a blessing when all that is needed from the trees is a great deal of wood fibre in a very short space of time. But it is a curse when what is also wanted – perhaps more so – is a very dense and very strong timber, for much more exacting uses. So, although plantations very definitely have their place in the scheme of things, they are not the only answer to getting more wood from our forests. There will still be a great need for all of those well-managed woodlands, as part of the total timber production picture.

I have said that plantations can be found all over the world, so now let me give you just a few examples, to illustrate the diversity of where an increasing proportion of the world's commercial timber supplies may now come from; both in terms of wood species and also in terms of their geographical spread.

New Zealand's timber industry – and thus its construction industry too – more or less depends upon an introduced conifer (although you can still get hold of small quantities of some native woods, especially for more specialist projects). That 'foreign' softwood is *Pinus radiata* – which is a true pine, and one which originates from North America: Monterey, in fact – hence its common New Zealand name of 'Monterey pine'. (In my previous book, I gave readers warnings about the plethora of names that timbers can be known by in the timber trade; and I recommended that everyone should try to stick to the timber's one-and-only 'scientific name' in order to avoid confusion: so please, I urge you, listen to my advice on this.) In the UK, although we don't import a lot of this last-named timber, whenever we do it is always known to our timber trade as 'Radiata pine' – though it is exactly the same stuff that the New Zealanders will call 'Monterey pine'.

Trees of the species *Pinus radiata* (or whatever local timber name you may want to call it) when grown in plantations in New Zealand can reach a harvestable diameter in 30 years or less. But in the UK we have our own favoured plantation species: Sitka spruce (*Picea sitchensis*). This tree originates from the west coast of Canada and it was introduced into the British Isles in the late 1870s; but then it was planted much more extensively after the First World War, when the government of the day created the Forestry Commission.

'So why Sitka spruce?' I hear you ask. And the answer is because it was found that it would grow well, and yet also grow quickly in poor soils; and it was thus deemed ideal to rapidly replace our depleted stock of native softwoods, without taking up the space needed for more valuable farmland, which



Figure 1.11 Radiata pine – an introduced species – growing in a plantation in New Zealand.

was better suited to crops or livestock. That's why almost all of our 'new' forests are conifers (90 per cent of which are Sitka spruce); and that is also why you will find them mostly on the western edges of Wales and Scotland, where the Gulf Stream produces a mild climate. And we should also not forget Britain's largest man-made 'forest', which is the Kielder Forest, situated across the Northumberland/Scotland Border country.

It is a fact that trees 'grown on' in our UK conifer plantations can reach a very useful and harvestable diameter in only about 35 years.

South America also has its fair share of plantations: both coniferous and broadleaved; and all of those have been introduced from elsewhere in the world.

As far as the conifers are concerned, these are almost all North American species. Radiata pine (once again) is grown in Brazil and Chile; whilst a species of the southern pine group from the southern states of the USA – *Pinus elliottii* – is also grown in those same countries; as it also is in Peru. (This timber is generally exported from South America under the trade name of 'Elliottis pine'; and it is nowadays mainly seen in the UK when it has been made into plywood, rather than it being sold as solid timber). Plantation softwoods grown in those different South American countries can reach a harvestable diameter in something under 30 years.

But South America is also home to some very interesting – and also quite recent – hardwood plantations as well.



Figure 1.12 The largest and oldest Sitka spruce in the British Isles, planted in Northern Ireland in the 1840s.



Figure 1.13 So-called 'Elliottis pine' – which is another introduced conifer – made into plywood in South America.

Teak (*Tectona grandis* – which is a native of Burma and the Far East) is now being grown in Bolivia. And one of the very many species of Australian eucalyptus (in this case, *Eucalyptus grandis* – although despite the second name, it is no relation to teak) is now being grown in Uruguay. That latter timber, by the way, is now being marketed in the UK under the trade name of ‘Red grandis’. That’s the timber trade for you, ever out to confuse the innocent customer.

The growth rate for these essentially tropical hardwoods, that are now being grown in non-native, and thus different, tropical or sub-tropical plantations, – is something in the order of 15–20 centimetres in diameter, in only 15–20 years. That is, to be fair, not comparable in size with their more majestic ‘natural’ (and somewhat older) cousins back home; but it is still large enough to produce good quantities of narrower boards, which are proving to be quite suitable for many furniture and joinery uses here in the UK.

Eucalyptus is a highly interesting genus of trees which, in its native Australia, produces an amazing variety of different timbers: ranging from very dense, hard and heavy to quite lightweight and pithy, or stringy. At the Victoria State School of Forestry near Melbourne, which I visited a few years ago, they have been researching one particular species of eucalyptus, known as ‘Blue gum’ (*Eucalyptus saligna*) and they have been trying to find out just how fast they are able to grow it, in their experimental plantations. (It is a native species, and so it has none of the other more advantageous ‘growth factors’ that I described earlier going for it, but it just naturally likes to grow fast, when competing with other individuals of the same species in the more restricted environment of a plantation.) And I have seen, with my own eyes, blue gum tree trunks of 20–30 centimetres in diameter, which grew to that size in only eight years (and yes, I did say ‘eight’). Characterful and dense oak trees they are not: but as a source of moderately strong fibre, with other interesting properties, they are doubtless going to be a very useful wood-fibre resource in years to come.

However, the fast-growth champions of them all must be those trees now being grown deliberately in farmers’ fields in Indonesia: which are specifically intended to be harvested and used for plywood production. Two types of tree are being grown in this way: Balsa wood (*Ochroma spp*) which is actually native to Ecuador in South America, and another, entirely unrelated species (*Albizzia falcata*), which is known in Indonesia simply as ‘Falcata’. Both of these trees can grow to an astonishing 30–40



Figure 1.14 Falcata logs, harvested after only eight years, being processed into plywood in Indonesia.

centimetres in diameter in only six (yes, six) years. That is a simply phenomenal growth rate.

Having the availability of very, very fast-grown plantation trees such as these species, then begs the question: how can such fast-grown timbers not be simply regarded as a straightforward crop; to be harvested and regularly re-planted, just like any other commercial crop would be? (In fact, to all intents and purposes, those last two tree species *are* being treated as crops; since they are being grown in fields by farmers, as I said, rather than in proper 'forests'.)

I really believe that it's high time everyone saw trees for what they really are to us: a natural, highly renewable resource: which can, when everything is done right, be grown in a sustainably-managed way. Forever.

2 The Concept of Being ‘Sustainable’

I’ve used those words ‘sustainable’ and ‘sustainability’ a few times now – and of course the word ‘sustainable’ is in the very title of this book. But what does that 11-letter word really mean in practice? And does it actually mean the same thing to everyone who uses that term? What is its significance in the context of growing and using trees for us all to use?

This chapter will seek to answer those questions; or at the very least, to give some further food for thought, on the whole subject of what we mean by being ‘sustainable’ in our everyday uses of wood. It is my aim to give you the latest ‘consensus’ view on what can – and should – be done to achieve the goal of ‘sustainability’, although there may well be some alternative opinions as to what that last point might consist of, in reality.

2.1 Being sustainable: A definition and a target

The Oxford English Dictionary defines the word ‘sustainable’ as: ‘conserving an ecological balance by avoiding depletion of natural resources’. But we have to ask ourselves whether that fairly straightforward and quite simple concept is a good enough definition for our present purposes and if it will suffice for the subject-matter of this book. (As it happens, the UK government has its own definition of ‘sustainable’, which is given as part of its ‘TPP’ – that is, the self-imposed Timber Procurement Policy, which all UK government departments have to follow, when specifying wood-based products for any

government contract. But I will be saying a lot more about the TPP later on in this book.)

Just for now at least, let's go back to the dictionary definition. We could, of course, fairly readily avoid the situation of any actual 'depletion' of the entire global timber resource by simply using up only that which we are able to produce or harvest – however that might be achieved in reality. But surely, in order to consider our use of *any* natural resource as being properly 'sustainable' (in the modern sense), then our target ought to be that of also *increasing* the availability of that resource, rather than just 'conserving its balance' at present-day levels. In other words, I believe that we need to go beyond the idea of simply maintaining the forests' status quo: and instead, we should be looking to expand the whole timber resource for the future. And we can do that in two ways: by continually growing more trees in our existing forests – making more efficient use of them by 'managing' them – and of course, by also growing some entirely 'new' forests as well, in places where there weren't any before (or at least, not for a long, long time).

As I was just describing in the last chapter – particularly in relation to the conifer forests of the Westernised world – we have definitely taken the idea of 'sustainability' well beyond the confines of simply maintaining the status quo. In fact it has been claimed by the UK Timber Trade Federation (as part of its 'Wood For Good' advertising campaign which was published throughout the 1990s and the 2000s – and which has just recently been revived) that by the twenty-first century, Europe's total forested area was actually increasing *every year* by an amount equivalent to the entire land area of the island of Cyprus. (That makes a nice change from the tropical rainforest depletion figure that was so often quoted during the 1980s and 1990s, where the 'loss' was always being compared to an area the size of Wales). And let's not forget that that stated increase in the overall forest area of Europe is of course a *nett* figure, not just the overall number of trees being planted or grown. It's the total increase in forest area *after* cutting down a mind-bogglingly large number of trees each year, as well. And Wood For Good has been focusing on the environmental benefits of trees and timber for much of the last 20 years.

In terms of the global use of timber and its 'impact' on our forest activities, the numbers are quite staggering. Even from our own perspective: you may or may not be aware that the UK alone has consumed something in the order of ten million cubic metres of softwood timber *per year*, on average, for the past



let's siphon the carbon out of the atmosphere and turn it into houses.

There is a very simple way to do this. Plant trees.

Trees soak up carbon dioxide and breathe out oxygen. The more trees we grow, the more carbon dioxide we pull out of the atmosphere, thus helping to combat global warming.

Europe's forests are expanding*. For each tree we harvest we plant at least two more.

And it's young trees that are most efficient at absorbing the carbon dioxide. That's why harvesting wood

from our forests makes good sense.

Now what shall we do with all that fine timber? Well, why not build beautiful, warm, well-insulated timber frame houses?

They save on heating bills, and burning less fuel means less carbon dioxide going into the atmosphere. And we plant more trees...

To learn more about how using wood can help fight global warming, please visit www.woodforgood.com, or ring 0800 279 0016.



wood. for good.

*'wood, for good' is a promotional campaign sponsored by the Nordic Timber Council, the Forestry Commission, the UK Sawm Wood Promoters, the Timber Trade Federation, the Forestry & Timber Association, and the Northern Ireland Forest Service. All sponsors are committed to sustainable forest management and encourage independent certification.

* Europe enjoys an annual surplus of growth over harvest of 252million cubic metres (source: UN-ECE FAO TBFRA 2000). That's almost 30 times the annual UK consumption of wood.

Figure 2.1 A typical 'Wood for Good' campaign poster, stating 'Let's siphon the carbon out of the atmosphere and turn it into houses' (Poster courtesy the UK Timber Trade Federation).

decade alone. Now multiply that figure by all of the countries in Europe; then add in all of the countries that Europe exports its felled and sawn timber and wood products to as well; and you will soon realise that all of the countries in Europe (and I am including Scandinavia in that equation) cut down a staggering number of conifer trees. Hundreds of millions of them, every year. But the good news, as I hinted at in the last chapter, is that we are actually replacing all of those millions and millions of trees: and not just at a rate which simply prevents their overall reduction, but at a rate which is genuinely increasing the total amount of forest cover every year – and by quite a significant margin, at that.

The picture is pretty much the same in North America too, where the ‘three for one’ principle has been practised for well over a hundred years, as I was mentioning in Chapter 1. (Have another look at what I wrote, if you’re not quite sure what I meant by that ‘three for one’ phrase).

2.2 What can we do to help?

By ‘we’, I mean everyone who uses a product that has been made from timber or from wood fibres in some way. So it’s not just the professionals that I’m talking to now, but their families and friends and in fact, the whole of the general public as well.

Just for a few brief moments, have a quick mental pause from forest and timber statistics and instead, have a think about everything that we might use in our homes which either is, or could be, made out of wood fibre in some way. Either directly, from solid timber; or from remanufactured wood products (such as chipboard, MDF, etc); or from reconstituted wood fibres, such as paper and cardboard. And to start you off on that mental exercise, here are a few examples of what I mean.

2.2.1 *Where wood is used in our lives*

The structural timber frame itself (if your house is of that sort of construction), the floor joists, the roof trusses and rafters, the doors and windows, all of the trim (that is, the skirting boards – even if they are made from MDF; that’s still wood! – plus the architraves and other mouldings, such as dado rails on the walls), the floorboards – and chipboard floor panels count, even if they are not made of ‘proper’ wood; the stairs (if you’re not in a bungalow); and most of your furniture, even if it comes from



Figure 2.2 Just a few of the wood or wood-fibre based things we use every day of our lives.

IKEA or somewhere similar. And we must include all of the paper-type products too, such as toilet rolls, kitchen towels, facial tissues, baby wipes, disposable nappies, incontinence pads (sorry to bring them in), books, newspapers, cereal packets, cardboard boxes ... need I go on?

So you see, it is very much in the interests of *all* of us to maintain – and especially, to grow and expand – our forests, and thus our timber resource, for the future, because we all need wood in some shape or form, just to make our lives worth living; and even – dare I say? – to make it *possible* even to live our lives at all.

I have said somewhere that wood is man's oldest building material (after he stopped living in caves, that is). The very word 'beam' derives, via Old English, from the German word 'Baum' (meaning 'tree'); and that very old word is still carried on even today, in a couple of our present-day tree names: such as 'whitebeam' and 'hornbeam'. You can therefore see that we have had a very, very long-standing relationship with trees, and with their timber and their wood fibres, stretching back for many thousands of years. And it's not only the things that we make from the products of trees that we need in order to live our lives, it's the very stuff that trees make for us, as well.

In my previous book, I explained in quite a bit of detail how trees manufacture oxygen for us, as a by-product of making cellulose for themselves; and I sketched that process in outline

in Chapter 1 of that book; so I don't propose to repeat all of that detail here. But it is worth stressing the point once again, that we also need to maintain and – ideally – to expand our stock of trees, even if only for the benefits that they give us in providing a significant proportion of our breathable atmosphere.

However – important though that is – I don't want to over-exaggerate the trees' 'atmospheric' contribution either. I am not one of those who gets too precious about the Amazon rainforest, by calling it, in that well-worn phrase: 'The Lungs of the World', in fact, what a ridiculous term that is, if you just stop for a moment to think about it, and perhaps examine its true, literal meaning.

Our own lungs take in oxygen – which we have to do of course, in order to survive – and we then breathe out carbon dioxide as our own, unwanted, 'waste product'. And so it is worth asking the question: does the rainforest take in lots and lots of oxygen and give out loads and loads of CO₂, just like our lungs are designed to do? No – of course it doesn't! On balance (and we should of course think about the entire 'carbon cycle' process as a whole), the rainforest gives out more oxygen than it takes in, and it stores up more CO₂ than it gives out: because every tree that is growing, and is still increasing in its volume, does so by manufacturing more and more cellulose for itself. And thus it perpetuates that 'simple-but-clever' chemical process: but as for *any* forest being like 'lungs' – that's just silly.

However, in order to complete the picture – and just for the sake of balance, as I have said – I should also tell you that all of the fallen trees, as they decay in the forest, gradually return their sequestered carbon to the atmosphere. And all of the fully mature trees – which have now ceased to grow and which therefore do not expand any further – simply settle down into the process of 'living' until they eventually become over-mature and thus die, and in due course, return their carbon 'holding' to the earth. And, whilst they are in that more settled, or 'mature' state, they simply just breathe – exactly like we do – and so they take in lots of oxygen instead; and they actually give out their surplus carbon dioxide into 'our' atmosphere.

Thus it is a fact (and not a very well-publicised fact, on account of its 'inconvenience' to those I have referred to elsewhere as 'tree huggers') that all trees which have reached maturity and which are no longer vigorous in their growth, do the self-same thing that we do. They use up 'our' oxygen and give us back their own, unwanted carbon dioxide instead. So trees – and the forests which they comprise – are not, always

and forever, the 'good guys' as the environmentalists like to make out. Unless, that is, we make a point of getting them on our side (the forests, that is, not the environmentalists, though it's quite nice to have them both!).

So there is a very powerful argument to be made for needing all of our trees to keep on growing vigorously, and then not allowing all of them – or maybe even, most of them – to reach their full maturity. We definitely need the world's forests to be well-managed; but also, and really just as importantly, we need all of those forests to be correctly *harvested*, if we are to enjoy any sort of civilised and healthy lives in the future. Because if we just leave the forests to look after themselves, they will most likely do that all right (look after *themselves* only that is): but then they won't really look after *us* very well!

And it really is as simple as that. We need to have more and more trees that are growing vigorously and which have not yet reached anything like maturity, so that they can all still be busy making oxygen for us and they can still actively store away all that harmful CO₂. And then when we cut them down, at a time when they are still vigorous (and also of course, we then plant lots and lots more to replace the ones we've just cut down), that 'virtuous circle' can in theory continue forever. That's why I have said that all of us can, and should, do a number of things to help sustain our forests; for all sorts of reasons, none of which are necessarily because we are in any way 'green' minded, or because we are any sort of 'environmental activists', we just need to make sure, for our own good, that we always have more and more trees. But we must *not* do it by simply hanging on to all the trees we've now got, until they get too old to be of any real help to us.

Just in passing, let me say – without mincing my words – that I absolutely hate with a vengeance those glib sayings which are designed (usually by those promoting other, competing materials) to make people feel 'guilty' about using wood. A typical slogan, which never failed to make my hackles rise whenever I passed it – and I believe I first saw it in the late 1980s – was: 'Save a tree, use PVC'. Not only did it imply that trees in general needed 'saving' – which is a complete nonsense, as I have already explained – but it also somehow gave the impression that PVC was a better alternative material to use for the product (which I seem to recall was generally some plastic windows or doors). But please tell me: how can PVC *ever* be better than wood? It is a plastic, which is made from oil. And since when has oil been considered to be either sustainable, or particularly environmentally friendly?



Figure 2.3 PVC for building products – is this really an ‘environmentally friendly’ alternative to wood?

I always used to get very hot and bothered whenever I saw that ‘Save a tree’ slogan; because it was nothing more than a con, which was deliberately misleading the great British public by using a spurious ‘green’ argument, and by playing on peoples’ (quite unfounded) fears of ever cutting down a living tree.

Maybe it’s as a direct result of slogans such as the one I just quoted above; or maybe it’s because the ‘tree huggers’ have quite a loud voice at the moment, but whatever the cause, I have met and spoken with many, many people – some of them being close friends, even – who were firmly convinced that it was more or less a ‘crime’ to cut down a tree: any tree, anywhere, for any reason whatsoever, and with no excuses allowed. But, assuming that you now don’t need too much convincing that oil is neither terribly sustainable in the long term, nor highly environmentally friendly; let me now expand on the argument that sits on the other side of that coin. Namely, that it is not only very often completely blame-free to cut down trees; but that it is an activity positively to be encouraged, for all sorts of reasons. And not least, because of the local people who live in the very places where the forests mainly are.

2.3 Using the forest resource: The economic argument

I said in the Foreword that no country with any sort of decent forest resource would readily contemplate the idea of metaphorically 'selling off the family silver'. That is, using up such a valuable natural resource willy-nilly, without doing something to help maintain its viability in the longer term. But I also hedged my bets, with regard to that sweeping statement, by describing the situation which still exists – to a greater or lesser extent nowadays – in some of the developing nations; whose political turmoil and (in many cases) corrupt leadership have led to a breakdown in their historically-established forest management procedures. Which means that there is 'bad' poaching and illegal logging happening, instead of – or sometimes even as well as – the proper replanting programmes and the fully licensed and controlled felling, which is 'good'.

But, just before I expand on the main thrust of this section, I'd like to digress briefly and consider the phrase I used just a moment ago: 'illegal logging'.

2.3.1 'Illegal logging'

Let me ask you honestly, what does that particular phrase mean to you? What image does it conjure up in your mind's eye? I wouldn't mind betting now that a lot of you are thinking of a band of mercenary timber traders, busily getting their grubby hands on some rare mahogany logs and ripping them out of the Brazilian rainforest, against the will of the innocent natives ... or something along those lines. Am I right?

But in fact, the 'timber trade' proper in the UK, never knowingly has anything to do with taking logs illegally from the forests of Brazil – or from anywhere else, for that matter. Now, before you accuse me of being too close to the industry, let me say straight away that I am not saying it *doesn't* happen with the occasional involvement of some elements of the world-wide timber industry. But it is the case that *real* 'illegal logging' happens far, far less frequently with any direct timber trade involvement, than the many stories in the media would have you believe.

It may surprise you to know this: but most of the so-called 'illegal logging' is not being done in order to get the trees out of the forest for their timber content; but simply *to get them out of the way*, so that the land they have been occupying can then be used for some other purpose (such as raising cattle for beef

production, or growing palm trees for palm-oil for the cosmetics industry, for example). It is a fact – as opposed to a media-hyped, somewhat poorly-researched story – that most of the ‘loggers’ who raid the forests are not thinking of the trees or the timber, at all.

So, the next time you see a headline about ‘illegal logging’, please read the details of the story more closely and see if the journalist then tells you what the land was going to be used for, after the trees had gone – that is, if they’ve bothered to dig any deeper and find out the real facts of the case and have not just blamed the ‘usual suspects’.

[I now want to add a small update here, which illustrates my last point very neatly. In June 2013, quite a few months after I first wrote those sentences about ‘media hype’ that you were just reading, I was listening to a BBC ‘Today’ programme on Radio 4, about forest fires in Indonesia that were creating a pall of smoke over Singapore. The presenter, almost without thinking, asked the local correspondent who was reporting from Indonesia: ‘I suppose the fires have been caused by illegal loggers?’ The correspondent didn’t actually respond to that specific query, but my point here is that the London journalist naturally *assumed* that any forest problems *must have* included ‘illegal logging’ as a matter of course, since – according to his own set views – it was happening in a tropical rainforest and therefore it must be true. And yet Indonesia is one of the countries in that



Figure 2.4 Palm oil: One of the *true* culprits of ‘illegal logging’? (Photo from Wiki Commons).

part of the world that is currently leading the way in terms of good, legal forest practices and traceable licences – see Chapter 3 for more detail on that very topic. So perhaps next time you hear those weasel words 'illegal logging', you may not be so ready to jump to the same erroneous conclusion that many journalists do.]

Now, to get back to my main point about 'selling off the family silver', as I have been calling it. If we are prepared to accept that everything is not yet perfect, insofar as managing the tropical forests is concerned, then we should at least also be prepared to accept that those who have some form of 'ownership' of those forests should also have a big say in what is done with them. Surely that is only fair?

2.4 Legal harvesting

Returning to my main argument: for those countries which see their native forests as the 'resource' which best suits their land and climate – in terms of its productivity and potential renewability – why then should they not be encouraged in using that resource? Of course they should, I hear you say, but that 'encouragement', in my humble opinion, should not include the use of heavy-handed tactics which all too often actively *prevent* the entirely legitimate sale of tropical timbers. That is something which definitely used to happen quite a lot in South America until very recently; and it is very probably still happening in certain other parts of the world (mainly the tropics), where some less-enlightened activists still operate. So let me explain exactly what I'm getting at here.

It is certainly very likely to have been true in the past – to a greater or lesser extent – that not all of the timber being exported from places such as the Brazilian rainforest, was being obtained in a very 'sustainable' way. And yet the true situation – even as far back as the 1970s and 1980s – was already being 'muddied' by confusion with forest clearances that were being done as part of making land available for crop plantations; using the somewhat alarmingly-titled 'slash and burn' agriculture technique, which became the bugbear and battle-cry of the whole 'Save the Rainforests' campaign in the last quarter of the twentieth century. (Surprisingly, it somehow got completely overlooked – or it was never properly understood at the time – that this much-criticised slash and burn technique was actually the very way in which the native Amazon dwellers themselves

managed their own farming; and that it was, to them, an entirely 'sustainable' way of living).

In any event, the upshot of all the adverse publicity about 'logging' was that (to mix my metaphors somewhat) the baby got thrown out with the bathwater. In other words, the voices that were being raised against forest land clearances were now also being raised against *any* form of 'logging' whatsoever, including much of the legitimate and fairly well-managed (or at least, well-intentioned) timber trading that had been going on for decades. The consequence of all that negativity was that a lot of 'rainforest' timbers began to be seen as problematic and so timber traders began to seek other, easier and less politically-charged sources of wood to buy and sell on the world markets. So, in quite a short period of time – less than a decade – very many of those hitherto popular rainforest timbers ceased to have as much value to the locals as they had before ... with the unfortunate result that the native peoples then needed to find alternative sources of income, because nobody wanted to buy their trees to use as timber any more.

So what did they do? They began to intensify the cutting-down of the rainforests (using 'slash and burn' again), but this time, in order to clear more land for crops that other people were prepared to pay good money for. Thus that whole, misguided 'do-good' approach became an example of what is known as 'the Law of Unintended Consequences'. It is just the sort of thing that tends to happen when a well-intentioned campaign to 'Save the Rainforests' ends up by accelerating their decline instead; and – in a few areas of the Amazon – almost past the point of no return.

Happily, there is now much more attention being paid to the desires and needs of the locals, when it comes to deciding what to do with their forests: although it's not all good. Some genuinely illegal logging still goes on in some parts of the world where the politicians are not yet honest or determined enough to do anything about it (some parts of Africa are still notorious for it). However, please do not blame the vast majority of that 'illegal logging' (which you may still read about, or hear about on the radio and TV) on the legitimate timber trade that operates in the UK and Europe, because it isn't them!

Work has been going on for many years now to encourage the timber industry in this country to do things properly and also to prove that they are still continuing to do it properly. Therefore, most of those companies dealing in wood products


in the UK now have a way to hold their hands up and say honestly: 'We're doing it right'.

2.5 The Timber Trade Federation: Introducing its responsible purchasing policy

It is well over 30 years since the UK Timber Trade Federation (which is the trade body that represents a large number of timber agents, importers and merchants in this country) began to take seriously the idea of being seen – by everyone – to have the right attitude towards sourcing timber and wood products from various parts of the world: and, at least in the first instance, more especially from tropical rainforests.

The TTF's series of 'Wood For Good' advertisements (one of which I referred to earlier) originally started out as a promotional campaign for wood, to help remind people of its role as a useful building material, and to tell specifiers once more about its many good attributes. But after a few years, as the momentum for 'sustainability' began to increase, the Wood For Good campaign shifted its focus much more onto the natural environmental benefits of wood: including one memorable 'timber head' picture, asking people to 'Think Wood' and to specify timber more, in order to help save the planet. (I have tried to find a picture of that head for this book, but sadly, without success. So I have reproduced another poster from later in the campaign, which encourages people to think about building with wood and echoes its 'environmental' credentials.)

Having been trying to encourage the use of wood because of its 'environmentally friendly' attributes, it was therefore not a very big step for the Timber Trade Federation to go on and encourage its membership to consider the circumstances under which they were purchasing their timber: especially (but not exclusively) from overseas; and to try and ensure that their purchases were – at the very least – being properly and legally sourced. Of course, it would be disingenuous of me not to mention the role that was played by the likes of the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC) in persuading – if not actually pressurising – the TTF to 'get its house in order'. But all credit to the Timber Trade Federation for taking notice of the groundswell of public opinion and then doing something positive about it, instead of trying to ignore it and hoping it




the only building material
that grows on trees.

Most building materials, once taken from the earth, can never be replaced.

Wood is different. It grows on trees. And in Europe we are growing many more trees than we use.* This is very good news, because, of all building materials, wood makes the lowest impact on the environment, consuming less energy to fell, transport and process**. The Building Research

Establishment's *Green Guide to Housing* demonstrates that timber walls, floors and windows have lower environmental impact, contribute less to climate change and cause less air and water pollution.

Isn't it a good thing we'll never run out of trees? Find out more about the good wood can do by calling 0800 279 0016, or visiting www.woodforgood.com



wood. for good.

*'wood, for good' is a promotional campaign sponsored by the Nordic Timber Council, the Forestry Commission, the UK Sawm Wood Promoters, the Timber Trade Federation, the Forestry & Timber Association, and the Northern Ireland Forest Service. All sponsors are committed to sustainable forest management and encourage independent certification.

** Europe enjoys an annual surplus of growth over harvest of 252million cubic metres (source: UN-ECE FAO TBFRA 2000). That's almost 30 times the annual UK consumption of wood. ** The energy required to produce one tonne of building material: Timber 2,000 kW/HRS; Aluminium 25,000 kW/HRS; PVC 45,000 kW/HRS (source: Centre for Alternative Technology)

Figure 2.5 Another 'Wood For Good' poster, stating 'The only building material that grows on trees' (Poster courtesy of the UK Timber Trade Federation).

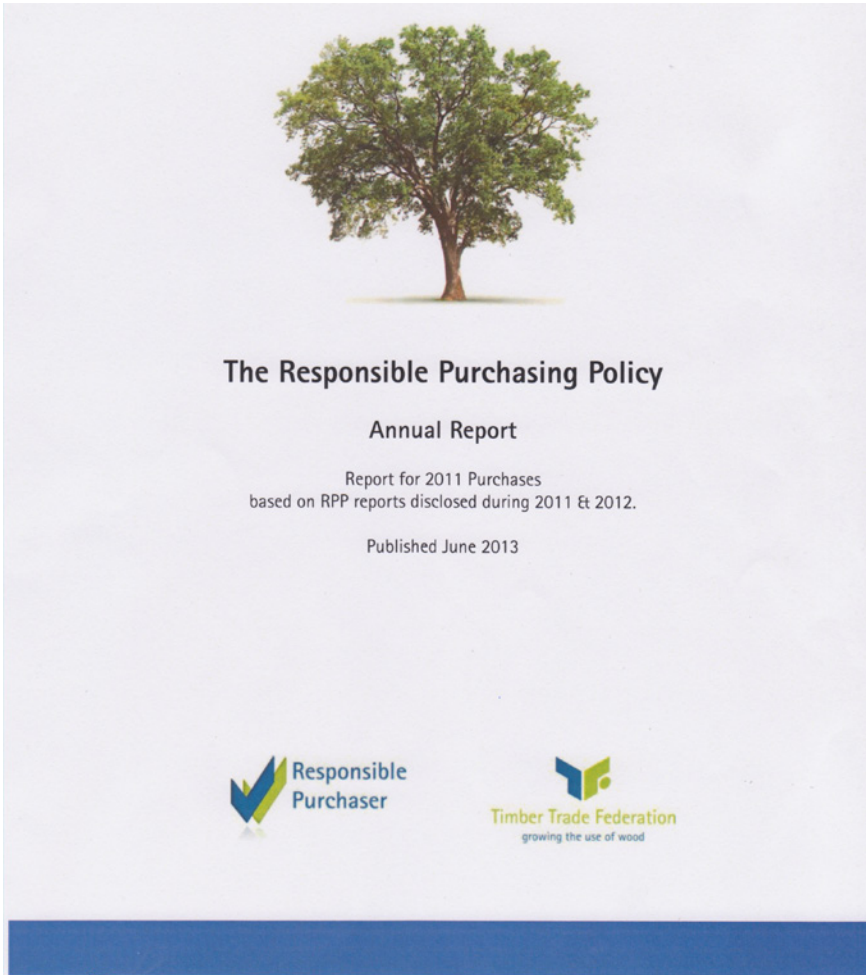


Figure 2.6 The Timber Trade Federation's Responsible Purchasing Policy: This information is requested from its membership to show that their purchases are, at minimum, from 'legal' sources.

would just go away. (I'll be saying much more about the FSC and the PEFC, and other similar organisations, in later chapters, when I shall deal with Chain of Custody and those sorts of things in greater detail.)

The first thing that the TTF urged its membership to do, in respect of being more aware of their obligations, was to consider signing up to a voluntary process, by way of a Chain of Custody Certification scheme. But after a few years, the TTF decided to go one step further and to introduce their own

scheme for members to sign up to: initially on a voluntary basis. And that scheme is the TTF's own Responsible Purchasing Policy, or 'RPP'.

The RPP currently requires all companies who are members of the TTF to show, by means of a traceable, fully-documented record system (either on paper, or held on a computer), that they have taken all reasonable steps to ensure that their purchases of timber and wood-based products have come from legally-harvested and properly-licensed sources. It is true that there is currently no requirement within the RPP to ensure that those forest resources are sustainably managed, but I firmly believe that this has definitely been a step in the right direction. And – along with the other new European regulations (of which also, more later) – it should help to eradicate all of the remaining illegal logging that still goes on within the wider timber industry, worldwide. At the moment, neither the TTF nor I could claim, hand on heart, that *all* forms of 'illegal logging' have been stopped as yet: since – as I explained earlier – a great deal of nefarious activity goes on, but it has nothing whatsoever to do with the UK timber trade. In fact, a lot of it has little or no need for the logs and the timber itself as a raw material: it's the land that most of them are after.

This chapter is not the right place to expand on this particular strand of my arguments and so I will explore the finer details of the RPP in the next chapter. I shall also talk about the most important of the alternative forms of certification, or other alternative proofs of 'good intentions' when purchasing timber. You will therefore find many – if not all – of the various voluntary schemes and their basic essentials, being dealt with in the chapter that follows.

3

Voluntary Timber Certification Schemes

In the previous chapter, I had just begun to touch upon the idea of Timber Trade Federation's Responsible Purchasing Policy (RPP); and I also referred to the idea of a 'Chain of Custody' for the timber. So I now want to explain a little more about those certification schemes; and to examine how they might fit into the quite new legal framework which the European Union has just recently introduced. (The main legal requirements for trading timber and wood products within the EU were actually introduced as EU law, during the very period in which I've been writing this book – as I hope will become clear later on, when I deal with 'legal requirements' in the next chapter).

The reason why I want to deal separately, and in more detail, with the various certification schemes in this present chapter, is that these schemes are, in the main, purely *voluntary* schemes, that the companies who trade in timber and wood products may choose to take part in if they wish to. This 'choice' may either be entirely on their own initiative, or it may be as a result of a certain amount of 'pressure' having been applied to them, maybe from their clients or customers, or perhaps via their own trade body – which in the UK is the Timber Trade Federation, as I mentioned before. On the other hand, the new European rules are actually *regulations* covering the legal purchasing of timber for sale within the EU, and so – being very new, and therefore somewhat at risk of being misunderstood – they deserve to have their own, more detailed description, in the next chapter.

3.1 Some further details on the RPP

The Responsible Purchasing Policy ('RPP') was instigated by the Timber Trade Federation back in 2010: and it was, in many ways, a natural progression from the encouragement that the TTF had already been giving to their membership for some years previously, in trying to get them to look more closely at where and how their timber supplies were being sourced.

An example of this 'early encouragement' that the TTF were giving to their membership is their involvement with the International Tropical Timber Organisation (ITTO). This organisation – and I apologise for the ever-increasing number of acronyms filling this book – was a very early body which concerned itself with better management of the tropical rainforests. The UK's own Timber Trade Federation was indeed sending representatives to the ITTO as far back as the late 1980s.

The ITTO was actually established in 1986; and it was formed with the very laudable intention of trying to 'square the circle' between those who, on the one hand, were concerned about rainforest depletion and those who, on the other hand, were trying to encourage the economic independence of many of the newer, emerging nations; and who saw the trade in tropical hardwoods as being a natural – in both senses of that word – way of achieving that aim. They were trying, in effect, to undo some of that 'Law of Unintended Consequences' which I wrote about earlier, whereby banning all trade in tropical hardwoods altogether was, at one and the same time, leading to their being devalued as a commercial source of revenue, for many of those developing nations.

Thus there were already forces at work, as far back as about three decades ago, being urged on by people who had the foresight to see that simply *banning* the harvesting (or 'logging' as it was already being misnamed) of trees for timber production, was not in itself an entirely sensible or well-thought-through idea. They realised that such a process was not likely to be very good for the long-term viability or the desired sustainability of the tropical rainforests, which so many other participants in the 'ecology world' were striving to preserve.

What I'm trying to say here is that it's not as though the TTF – and the rest of the UK timber trade as a whole – woke up one morning at the dawn of the new millennium and suddenly thought: 'Oh gosh, we'd better buy our timber from more reliable sources in the future!' It might now seem to be obvious – with the

great benefit of 20/20 hindsight – that there had been quite a long history of dawning awareness that things could be done better. But – just as importantly, if the timber trade were not to be seen as the bad guys in all of this – it was vital that things must be *seen to be* being done better, by all those who were dealing in commercial timber supplies. And so for the TTF to create a formal (albeit voluntary) scheme, was quite a bold step to take, for what is essentially a trade body, with a highly disparate (that's 'disparate' – not 'desperate'!) membership to 'keep on board', so to speak.

I said just now that the RPP Scheme is 'voluntary'; but in fact these days that is only just about the case, if you do not belong to the Timber Trade Federation. I say that, because it is now a basic requirement of TTF membership that *all* existing members *must* either subscribe to the TTF's own Responsible Purchasing Policy, or they must show the TTF that they have a workable and robust due diligence system of their own. Therefore the only way *not* to have to fill out the annual RPP return, is either to create your own credible recording and reporting system, or not join the TTF in the first place ... or perhaps to resign your present TTF membership, and then leave the Federation (as one or two companies threatened to do, when the RPP was made more or less compulsory).

However, since membership of the TTF is, of course, entirely voluntary, it therefore follows that the UK's RPP Scheme itself is not 'mandatory' in the very literal sense of that word. But I believe that it is a very sensible thing to do; to have access to a well thought-out, clearly documented system, without needing to effectively 're-invent the wheel' for yourself. And so TTF membership may be the best answer for the majority of timber traders in the UK, when it comes to satisfying the new EU regulations.

As an essential requirement of the RPP, all TTF members need to fill out a series of forms which are intended to document – in some considerable detail – where all of their purchases of timber and wood-based products have originated from. And thus it is not just the supplies of basic 'timber' alone (i.e., solid wood), such as the tropical hardwoods which started off the whole business of the public's awareness of forest depletion in the first place – it is in fact *any* wood-based item at all, that is bought or sold from around the world. This also includes any timber or wood-based products which originally 'grew' at home: and so it concerns all temperate hardwoods as well as tropical ones. That therefore means all softwoods whose logs

were purchased from within the EU, or from anywhere else in the world; all wood-based board materials such as chipboard, plywood, hardboard and MDF; and even joinery and furniture items, if they are traded directly by a TTF member. All of these 'wood' purchases are scrutinised very closely by the RPP's auditors, to check the propriety and legality of their origins.

Of course there are logging licences and certificates to be inspected; so that the purchases of timber (or other wood-based goods) can be seen to be 'trustworthy'. But that then begs the question: 'How can we trust the authenticity of the certificates themselves?' And that is where the Corruption Perceptions Index comes into the picture.

3.2 Checking legality – I: The Corruption Perceptions Index (CPI)

The CPI (another acronym – sorry!) acts as a sort of 'ranking' of countries in terms of their perceived level of likely trustworthiness in their public sector. (I say *perceived* because there is obviously no way of actually *measuring* such a thing as 'trustworthiness', or its opposite, which is 'corruption'. The data which the CPI uses is based on feedback from numerous sources; many of which are people 'on the ground' and who therefore have good local knowledge. The CPI is thus based on a number of different data sources, which capture both business and expert views about 'official' behaviour. Each of those CPI's sources is selected, based on very specific criteria, in order to ensure that the collection of their data is reliable and from credible institutions.

The CPI has various indices, covering different forms of governmental corruption, but the part of the CPI which specifically interests us here, is the one dealing with forest resources.

This looks at the likelihood, or otherwise, that any logging licences or certificates of origin may have been 'faked' or possibly obtained by means of bribery or coercion; or as a result of some other illegal practices by government officials, or perhaps others in the public sector further down the chain of responsibility. So who exactly is it who compiles this useful index?

The CPI, as it is almost universally known, is published by an organisation called Transparency International; and they claim on their website that they have brought the issue of 'illegal logging' to the notice of many governments around the

world, and have thus helped greatly to limit the traffic in illegal timber. The first CPI was published back in 1995 – almost 20 years ago – and the most recent index that I have been able to access for the purposes of this book, relates to data that was gathered and then released in 2012.

Originally, the CPI had a method of ranking and assessing countries using a ‘points’ system, which awarded marks from 1 to 10, with gradations of 0.1 of a mark. Thus, one country might be rated as (say) 5.1, whereas another might be rated as 8.6, and so on. Essentially, the closer the score was to 10, the ‘cleaner’ and more ‘honest’ the country and its officials were deemed to be. But the further down the scale towards zero it went, the more corrupt and dishonest the public sector was perceived and assumed to be. (And it is my understanding that, for the purposes of judging acceptability within the RPP, the TTF’s scheme auditors have tended to regard any score below 5.0 as being ‘bad’ and anything above that mark as being ‘good’. On the basis of any ‘bad’ score, they then asked more searching questions of the TTF member about his sources of supply from that ‘bad’ area of the world.)

But with the 2012 issue of the CPI, the ‘scoring’ method has been changed; so that it is now given in the format of a scale going from 0 to 100. Thus the nearer to 100 any one country gets, the better the perceived level of their public sector corruption is supposed to be; and the lower down towards zero that a country is rated, the worse is its perceived level of official corruption. At this point in my explanation, it would seem natural for you to ask: ‘Well, who are the best, and who are the worst countries, on this scale of “perceived corruption”?’ And whose certificates and licences should we trust; and, conversely, whose official paperwork and proffered documentation should we be more suspicious of?’ As that is a very fair point, I am now happy to tell you.

The relevant table in the CPI works by showing a sort of ‘averaging out’ of the various opinions or ratings from all of those ‘on the ground’ data sources, who are primarily independent institutions specialising in governance and business climate analysis. Therefore, the scores in the CPI table are shown as falling within a range of two or three points, rather than being given as a single value. (I suspect that’s because, since these are purely ‘opinions’, then not every reporter will be giving any one country exactly the same score as another reporter, about that country’s honesty.) But for my purposes here, and for the ease of understanding the basic

process, I will simplify matters, to the extent of giving just the basic 'score'; and without worrying about why there may be minor variations of 1 or 2 points in their reports. (After all, it's really the principle that I want you to take away from this, you can explore the finer details of the CPI for yourself, later.)

Having established the way it is supposed to work, let me now tell you that joint first place in the 2012 CPI table goes equally to Finland, Denmark and (a little bit of a surprise, perhaps?) New Zealand. These 'leaders' have scores of 90, for each of those highly thought of countries. Sweden comes in at a very respectable fourth place with a very good score of 88; and Canada is only just a short way behind, on a rating of 84.

'So where are we in the UK, then?' I now hear you ask, since we like to think of the UK as being totally honest and above board in everything we do. And the answer – at least, according to Transparency International – is that the UK is placed a fairly lowly 17th equal, overall: with a modest score of only 74. And that position is – really quite surprisingly – behind even Barbados, who score a respectable 76. (I should stress again, at this point, that the operative word here, in respect of the CPI, is that of 'perception'. Transparency International, as I mentioned earlier, compiles its list based on feedback from numerous correspondents, which means that the net score is a sort of aggregate opinion, and so its precision may be a little open to question – rather than it necessarily being taken as the Gospel truth.)

In terms of the countries that we in the UK import a lot of our timber from, the picture is somewhat mixed, to say the least. Finland and Sweden are – as you have just seen – ranked very highly on the CPI, at equal 1st and 4th places respectively. But Latvia – which is still a major exporter of timber to the UK (primarily in terms of softwoods) – languishes down in equal 54th place, on a seemingly very poor rating of only 49. And Brazil, with a CPI score of 43, occupies an even more lowly (and, according to the CPI, a much more questionable) 69th place.

So who is at the very bottom of this particular 'corruption heap' – if I may call it that? There are probably no great surprises here: just think of some typical countries that you would naturally assume to be 'corrupt', and you'll very likely be right. Sharing joint last place at equal 174th, and with only 8 points each out of 100, the bottom three countries in the 2012 CPI are: Afghanistan, North Korea and Somalia. It's just as well that – as far as I'm aware – the UK doesn't buy its timber from any of those three places!

176 COUNTRIES.
176 SCORES.
HOW DOES
YOUR COUNTRY
MEASURE UP?

The perceived levels of public sector corruption in 176 countries/territories around the world.

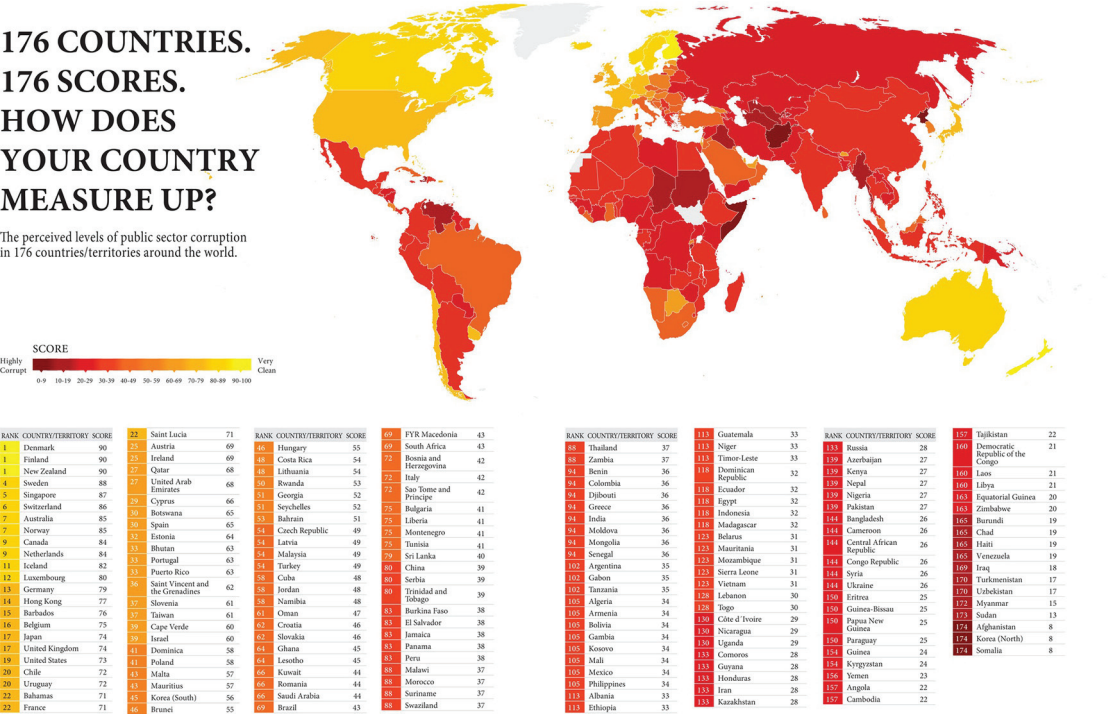


Figure 3.1 Transparency International's Corruption Perceptions Index measures the perceived level of public sector corruption in countries and territories around the world.

However, a word of caution here. In my own opinion, just because a country may have a low (or worse than might be desired) score in the CPI, it does not mean that you should necessarily boycott such a country and refuse to buy anything from it. The lower ranking of any particular country in the CPI table (Afghanistan, North Korea and Somalia possibly excepted) really means, in practical terms, that you need to be extra careful in asking for – and in double-checking – any paperwork which purports to validate any specific timber purchases from that source. And there are ways of obtaining some better types of reassurance: often by means of some of the other certification schemes, which I will be covering later in this chapter.

Then there is also the question of which precise types and species of timber or wood-based products are being purchased: whether they are tropical hardwoods from a natural forest, or timbers (which could equally be hardwoods or softwoods) from a managed forest or a plantation. Brazil is a very relevant case in point: since I have just shown you that, according to the 2012 CPI, it falls a little bit below the recognised or ‘accepted’ lower limit of ‘trustworthiness’ with a score of just 43. And yet, a very high proportion of the ‘cheap’ building plywood that we use for our projects in the UK is sourced from Brazil (see Figure 13 in Chapter 1). So should we immediately stop buying all of it on the basis that we can’t trust it to be legally harvested? The answer to that somewhat vexed question, in my opinion, is a qualified ‘no’ – and here’s why.

Almost all of the building-type plywood now being purchased from Brazil (and also from a number of other South American countries, such as Chile) is, as I said earlier, of a type called ‘Elliottis pine’. This is a softwood plywood which comes from very fast-grown trees, which have been grown in a plantation; and whose genetic seed stock originated from the southern states of the USA (and where that ‘native’ wood is sold to the world as ‘Southern pine’). By and large, there is nothing wrong with the ‘sustainability’ credentials of any of this South American-grown Elliottis Pine, since it is being grown in very well-managed plantations, at a quite rapid rate of crop rotation; and it is not threatening the viability of any of the natural tropical rainforests in any way, as far as can be ascertained. I should also add here that many of the South American producing mills sometimes use Radiata Pine as well as – or instead of – Elliottis pine: and this is yet another of those ‘introduced’ plantation softwoods, which grows more rapidly when planted in that part of the world.

There are exceptions to this ‘good practice’ that I have just outlined (as there are in all things) but most of the reputable mills in South America which make plywood or other products from plantation-grown softwoods operate with an ISO 9000 Quality Assurance Scheme, or some other form of independent quality certification; which is generally provided by reputable, independent, certifiers from the West – some of them even being based in the UK.

So these softwood plywood mills are very much more ‘trustworthy’ – at least in respect of their plantation-grown timber sources – than that simple, base ‘corruption level’ figure of the CPI would seem to indicate. And, as I hinted at above, the same thing can apply to a range of many other wood-based products, apart from just plywood.

There are many other solid wood products, such as shelving, doors and furniture, which are also made from plantation-grown timbers (both softwoods and hardwoods); and which are destined for many of the UK’s larger DIY chains – all of whom take their ‘sustainable sourcing’ responsibilities very seriously indeed.



Figure 3.2 A typical softwood door made from timber grown in a South American plantation.

3.3 Checking legality – II: FLEGT

So, back now to our discussion about the RPP. The CPI is only one of the ways in which the TTF's scheme auditors (who have the responsibility for checking the RPP paperwork after it has been duly completed by the timber trader) can seek to confirm the possibility that wood products have been obtained legally or otherwise. Another approach – which in many ways is very much more straightforward – is to see if the supplying country is a member of something known as 'FLEGT' (which is pronounced, as I have been told on very good authority: 'Fleg-tea').

This acronym FLEGT (yes, sorry – another one) stands for: 'Forest Law Enforcement, Governance and Trade'; and it is the European Union's own way of assessing the legal status of timbers being exported from countries that were often suspected, in the past, of not following good legal harvesting practices. They were often accused of more or less permitting – if not actively encouraging – illegal logging (timber harvesting) activities to occur in one form or another; and also of turning a blind eye to corruption and/or the issuing of forged logging licences.

The EU has been working hard on its forestry monitoring methodology and it has also been working alongside exporting countries, using a procedure known as the 'VPA' – or Voluntary Partnership Agreement. This is where the EU has managed to get the governments of many major timber exporters to put the full FLEGT practices and requirements in place. And this is most important; since it ensures a much better success rate, where the co-operation with the EU's requirements is voluntary; rather than it having been forced onto a country by pressure from outside bodies. This then means that the governments of the exporting countries themselves will try to do their utmost to deter bad practices, and to eliminate corruption as much as possible from their own log licensing infrastructure and their own government bureaucracy.

Indonesia – to which I referred in the previous chapter – is a country that now (and by 'now' I mean at the time of writing this book) presents itself as a very good example of this new type of 'inter-governmental co-operation process' in action. At the start of the twenty-first century – only just a decade or so ago – Indonesia's reputation for political and bureaucratic honesty was way, way down: very near to the bottom of the Corruption Perceptions Index. And as a timber-supplying country, it was almost a by-word in the West for officially-sanctioned and corrupt forestry practices, illegal logging, and –

as a consequence – rampant and rapidly growing deforestation of its tropical forest reserves. So it is quite remarkable to be able to report that, from the start of 2013, Indonesia has now been accepted into the FLEGT VPA scheme and it has recently begun to send trial shipments of fully legally-harvested (and of course, fully-certified) timber to the EU, under its own fledgling ‘legality’ scheme.

This scheme is known in Indonesia as the ‘SVLK’ (which stands for Sistem Verifikasi Legalitas Kayu); and it is a government-backed, fully monitored, legality quality assurance system; which is subscribed to by all of the timber and wood-based products exporters based in Indonesia. At the start of this chapter, I said that many of the timber licensing schemes that are in existence were nominally voluntary: but that is, in many cases, really only from the point of view of the timber buyers (importers). So, although it is not compulsory to *buy* timber from a FLEGT source, it is Indonesia’s intention that all *exporters* who *sell* wood goods from that nation in the future, will have to be members of their country’s SVLK Scheme: and thus they must then be part of the wider European Union FLEGT VPA system. In this way, Indonesia – very laudably – intends to drive out illegal logging completely from its timber exporting system and thus eventually (and not too far in the future, one hopes), out of their country for good.

With regard to the UK and the Timber Trade Federation’s RPP, using the FLEGT process should be a really easy way for the importers of wood products to be comfortable about the goods they are bringing in to any part of the EU. And of course, for those needing to comply specifically with the TTF’s own RPP scheme, they will be able to comply with its rules about ‘legal’ purchases straight away, without any difficult questions being asked. And the more timber-exporting countries who get on board with FLEGT, and who put in place their own EU-agreed VPA, the easier it will be for the timber trade as a whole to set everyone’s minds at rest about using and renewing the remaining reserves of the tropical rainforests – and to show they are using them properly.

3.4 Going beyond FLEGT: MYTLAS

Having just praised Indonesia for getting its act together and adopting the FLEGT VPA approach with its SVLK scheme, I must now mention Malaysia and its own success story in that respect.

Malaysia has been pursuing the FLEGT VPA route for a few years now; and it also has its own Chain of Custody Scheme (I'll say more on that later in this chapter). But in respect of the 'legality' of its forests and the logging which takes place in them, Malaysia has now gone a step further than simply using the FLEGT VPA scheme; by launching – in late 2103 – the 'Malaysian Timber Legality Assurance System' (or 'MYTLAS' for short). This latest move has grown out of that country's work on establishing a legality assurance system (known as a 'LAS') for itself, as part of the whole FLEGT process. So now Peninsular Malaysia (which is the 'main bit' of the country) feels that it has got those mechanisms securely enough in place to be able to licence logging from its principal forest areas, with a high degree of reliability and trustworthiness.

Malaysia has acknowledged the impetus which the introduction of the EUTR (qv) has given it; and it now expects that its MYTLAS procedure and documentation will assist European buyers in achieving the necessary due diligence to satisfy EUTR. (For a full explanation of both of those last-mentioned topics, please see the next chapter). Of course, MYTLAS documentation should only be needed where full Chain of Custody Certification is not being used, as you will soon learn.

3.5 Checking legality – III: Other 'legality' certification schemes

As I have explained above, FLEGT, SVLK and MYTLAS are primarily 'legality only' schemes: and the one thing that they all have in common is that they are government-backed; either by the EU (through a FLEGT agreement) or by a particular country (for example, Indonesia, in the case of SVLK and Malaysia, in the case of MYTLAS). However, there are other 'legality only' schemes in existence, which are operated by the private sector, on a commercial basis, and these are not unlike full Chain of Custody Schemes, but without the guarantee of full forest 'sustainability' which those latter schemes aim to deliver. However, I need to add a word or two of caution here, about the plethora of 'legality' schemes which are out there.

Some schemes are a bit 'woolly' on what they define as being 'legal'; and also on the standards of proof that they insist on. And some schemes cover forestry operations in greater depth; whereas others concentrate purely on the harvesting and the issuing of Logging Licences. Some schemes concentrate solely on the 'legality' of the closely-defined forestry operation, more

or less to the exclusion of any other trade or customs legislation that may apply in the exporting countries, and so it may transpire, for example, that the trees were allowed to be *harvested* but then they should not have been *exported* without the proper paperwork. Is that then ‘legal’ timber, one has to ask?

This whole area is quite a ‘minefield’ and I strongly commend to you a publication that was issued at the end of 2012, on behalf of the European Timber Trade Federation (this body is not to be confused with the UK’s own TTF). This ETTF booklet is entitled ‘Main Report – Assessment of certification and legality verification schemes’ and it was written by an organisation called Proforest; who are an independent consultancy company, concerned with global forestry policies and practices. (In fact, it was Proforest who first ran the UK-government-funded body, CPET, which I have already mentioned; and which is now being run by a different company on the government’s behalf.) This booklet examines in fairly minute detail the various certification schemes – including the best-known Chain of Custody Schemes – and it concludes that (to paraphrase it somewhat bluntly) ‘some schemes are more reliable than others: but FSC and PEFC are perfectly OK’.

Having given you the caveat about various of the ‘legality only’ schemes, two of the more reliable certification schemes for legal compliance, that now I want to mention here are known, for short, as TLTV and OLB (Oh no! Not more acronyms!) Each of these schemes is run by a very reputable private company; and the membership of either scheme – just as with full Chain of Custody – is on a voluntary, fee-paying basis. Obviously, it is always more desirable to have the sustainability of one’s timber supplies, as well its legality, properly assured: but the reality is that often – especially with regard to many of the tropical forest areas – legality is all that can reasonably be hoped for at the present time. And of course, that is very much a step in the right direction: and it avoids the stigma of ‘illegal logging’ and all the bad vibes which that very phrase conjures up.

3.5.1 TLTV

This scheme is operated by the international group SGS who are based in Switzerland, but who have offices and agencies worldwide. They also – amongst many other things – manage private forest operations in the UK and Europe, as well as awarding full Chain of Custody Certification on behalf of FSC and PEFC (I will be explaining more on C-o-C later in this chapter). The initials ‘TLTV’ actually stand for ‘Timber Legality and Traceability

Verification', although that rather long-winded title is seldom used in its full version. And this scheme is pretty straightforward in its concept; that there has to be a robust system of ensuring that good forestry practices are being adhered to; and there must be a proper licensing system for logging, which is guaranteed to be free from any corruption in the issuing of those licences. Schemes such as this mean that there can now be valid, third party assurance, showing that the supply of a particular species of timber from a particular forest area has been obtained in a 'proper' manner and that it may then be traced through the various links in the Chain of Supply; so that the eventual purchaser can be assured that the timber he is buying, is the same timber that was legally harvested in the first place. (It is not so very different from a 'full' C-o-C Scheme, except that it cannot – as I have said – say anything about the sustainability of those legally-obtained timber supplies.)

3.5.2 OLB

This scheme – which is not dissimilar, in both its concept and its operation, from TLTV – is run by a French organisation called Bureau Veritas, which, rather like SGS, runs operations in many countries worldwide; and which certifies more than just forests or timber. Its scheme is called (in French, naturally!) 'Origine et Légalité des Bois' – hence the initials OLB – but in English, it is translated as 'Timber Origin and Legality'. As you may discern from the title, this scheme also aims to guarantee the legality and traceability (through its 'origin') of any particular timber species, all the way through the supply chain to the eventual purchaser. And, like TLTV, it does not purport to prove the timber's 'sustainability' credentials in any way, for the reasons I have outlined above: but once again, knowing that the timber has been 'properly' harvested – and from specified forest areas where the correct controls are in place – is a very big step in the right direction.

3.6 Checking sustainability: Chain of Custody Certification

The specific term 'Chain of Custody' – which I have, until now, merely mentioned a few times in passing, and abbreviated to the less cumbersome 'C-o-C' – seems to mean various things to various people, but not always with any great degree of certainty

or accuracy. However, one very common thread, in all of the verbiage that is bandied about, is that rather over-used word: 'certification'.

Many specifiers nowadays talk or write about 'certified timber' as though there is only the one defined way to show that timber intended for a particular project is somehow 'good', or 'safe', or 'valid' to be used. And more often than not, that very phrase 'certified timber' will be coupled with the name of one of the leading independent certifiers of sustainable timber supplies and that name usually happens to be that of the FSC (which is the 'Forest Stewardship Council'). But there are other certifiers in the world too; and the use of their schemes and their logos is also perfectly valid – when correctly complied with, of course. So it bothers me (quite a lot, in fact!) when I see or hear about specifications which demand that: 'all timber is to be FSC certified', or some such very similar wording.

What any specification involving timber or wood-based products should contain – that is, if it is seeking to require any supplier to conform to a desired policy of 'proving' that their timber supplies come from legally-harvested *and also* from sustainable sources – is a phrase which goes more or less along the lines of: 'All timber and wood-based products should be certified under a valid Chain of Custody system'. And that specified requirement should then leave the supplier to show that his timber does indeed meet that very simple and basic need, without pinning him down to only one particular 'verified' supply chain. What I am trying to say here is that the initials 'FSC' are all too often mistaken as being *the one and only approved* timber certifier. Or perhaps – and this may be worse – those initials are being quoted because of some misconception that the FSC is 'better' or 'more reliable' than other schemes. (I personally think that that particular 'misunderstanding' is considerably worse than not knowing that other schemes exist.)

And yet the FSC is only *one* of four or five 'approved' Chain of Custody schemes which are in use worldwide: which of course means that there are other ones out there which are equally as valid and reliable as FSC. In fact, somewhat ironically, the FSC is not even the world's largest timber certifier, in terms of the total volumes of forest which it has under certification. That honour goes to the PEFC (which stands for the Programme for the Endorsement of Forest Certification), which has about twice as much of the world's forest resource under its umbrella than the FSC does. In fact, the latest figures that I have from the government – as of 2013 – are that approximately 9 per cent of all



Figure 3.3 A typical example of the FSC logo on wood-fibre products, in this case, toilet rolls.



Figure 3.4 The PEFC logo currently only appears on commercial packages of timber, even though there is more PEFC-Certified wood in the world than there is FSC.

the world's forests are now fully Chain of Custody Certified: with 3 per cent of that total being FSC and 6 per cent of it being PEFC. (What? You hadn't heard of the PEFC before? Well, I'm disappointed, but not really very surprised: since it has a much lower profile than FSC, for reasons which I shall now elaborate upon, below.)

3.7 FSC and PEFC as Chain of Custody Certifiers

The FSC is, without any doubt, the best-known 'brand' in the Chain of Custody universe. That is certainly because it advertises itself a great deal, but it is also because the FSC has captured the limelight rather effectively, by getting its logo printed onto the paper, packaging and cartons of many of the world's leading branded products (just take a look at the menus, or the cardboard drinking cups, of several of the high street fast-food outlets or coffee shop chains; and you'll see what I mean). Conversely the PEFC – although it is considerably 'bigger' – is nothing like so good at self-promoting: but then, there is a very good historical reason why those two organisations are so different in their outlook and behaviour (and also, incidentally, in the general public's perception of them both).

The FSC began life in the 1980s; and it was formed by 'greens': by which I mean, people whose main aim was the preservation of the planet, rather than being wedded to any particular commercial enterprise. And the FSC Founders' initial *raison d'être* was primarily to increase awareness of the depletion of the tropical rainforests and to draw attention to the 'questionable' origins of the supplies of many tropical hardwoods that were then to be found on world markets. And I must declare, here and now, that I have no problem at all with those primary objectives.

But then, after a few years, the FSC became very much more 'commercial' in its operations, and it began to turn its attention towards the temperate northern hemisphere softwoods. Here, however, there had always been a much longer history of looking after the forests for successive generations, as I have indeed outlined in an earlier chapter. And the FSC (at least, according to some of my sources, who are very close to those northern softwood forests) began to 'nag' at the Europeans and the Scandinavians about their forest practices; and to suggest that matters needed to be taken in hand, along FSC lines and according to the FSC's guiding principles, which meant that, as well as managing the forestry operation itself, it would look after local 'native' peoples' interests, and so on.

The final upshot of all this pressure from the FSC was that some of the Northern European and Scandinavian forest owners got together and decided to form their own certification organisation, more or less in order not to have to 'toe the line' (so to speak) of the FSC, whose attitudes and

doctrines they did not – and could not – wholeheartedly support. Besides which – according to their own way of reasoning – they already *had* good and long-established forestry practices; and ones which had been going on for more than a century before the FSC was even thought of. So thus was born the (originally titled) ‘Pan European Forest Certification’ organisation, which was formed by many of the Scandinavian and European forest owners who had the twin objectives of sustainable – but nevertheless, fully *commercial* – forestry as the core of their own *raison d’être*. It was some years later, when they realised that they could, and should, have a more global – and thus a not exclusively European – reach, that the PEFC changed their name to the one that I quoted earlier, i.e., the ‘Programme for the Endorsement of Forest Certification schemes’; and they managed to do that whilst very cleverly sticking to their original initials of ‘PEFC’. You have to admire that.

That ‘disagreement’ within the world of timber certification is why you will find that all of the German softwood forests and sawmillers who operate under the aegis of a Chain of Custody scheme are PEFC Certified; as are many of the Swedish forests and producers; and (as far as I am aware) all of the Finnish Chain of Custody Certified softwood growers and producers too.

So then, the essential difference between those two main Chain of Custody Certifiers is basically in their attitude and philosophy, which is actually quite some difference, if you only dig a little bit deeper into it. The FSC believes in Chain of Custody as a *principle* which is entirely for the good of the forests, almost (although these days, not completely) regardless of the cost of ‘doing it properly’. Whereas the PEFC believes in sustainable forestry that is founded first and foremost on a



Figure 3.5 The FSC Chain of Custody licence number stamped on a timber product.

sensible, commercial footing: with the cost of that certification being kept to a minimum (and that is the main reason why they don't spend very much of their income on advertising themselves).

However, the problem for those buyers seeking certified timber – and yet not knowing exactly what to ask for – is that there is not one single 'chain' of supply which can validate all sources of timber from everywhere. Because the two leading organisations in the field do not presently get on with each other, largely due to their opposing philosophies. (That is, in any event, my take on it, based on many years of dealing with C-o-C certified timber). What is absolutely certain is that they do not allow for 'mutual recognition' – whereby certified timber from one source (say FSC) could be mixed with that from another (say PEFC); and thus all of that timber could – as we might see it – be used collectively to satisfy a supply requirement, where one source alone might not be able to fulfil that need, either because of sheer volume, or perhaps for other commercial reasons. (There is one exception to this rule, which is 'UKWAS' – and I will be saying something about that before I close this chapter.)

So it is a rather annoying fact of present-day timber trading life, that timber stockists are required to keep completely separate stocks of FSC or PEFC certified timber (quite literally, physically separate, in different areas of their storage yards); and they may not 'mix' them in any way. They must also carry duplicate certification documentation, since one system is not recognised by the other. And in my view, that sort of unhelpful lack of co-operation leads to a duplication of effort; and thus it is an unnecessary waste of time and resources that does nothing to help to push forward the cause of Chain of Custody Certification. Which is a pity, because its overall aims are very good.

[I now find that it is necessary to add a little bit more 'updating' to this book: because – as I said much earlier – things are tending to change quite rapidly all of the time, in the current world of 'sustainability'. So – having just put forward my own personal 'gripe' about why there should be no necessity for two lots of Chain of Custody Certification, simply because the two main protagonists cannot co-operate – I now find that life is imitating art, so to speak, as it quite often does. The trade press has recently reported (as at August 2013) that the UK timber trade is 'very positive' about plans to create an International Standard – or ISO – for the Chain of Custody in forest products. Apparently, this plan has been put forward

jointly by the Standards Organisations of Germany and Brazil, known as 'DIN' and 'ABNT' respectively (these are similar to our own BSI): and the plan is being welcomed by many as a way of eliminating the duplication which the timber traders find so irritating. But it is also reported (perhaps unsurprisingly) that the FSC is unhappy with the proposal; and it has accused both DIN and ABNT of a 'lack of consultation' and of presenting 'figures about cost-savings for companies without any evidence'. (I am not particularly surprised by the FSC's attitude to all this: but I am still rather disappointed by it.) However, the various critics – and, dare I say, the vested interests behind such criticism – of a universal ISO standard on Chain of Custody for the timber supply chain need not worry too much at present, because these things never happen quickly. The average time taken to propose, write, approve and implement any new standard is at least five years, and even then, that is only if it is fast-tracked and there are only minimal objections to its draft contents along the way. So we're not likely to see this potentially ground-breaking ISO on Chain of Custody for forest products much before the start of the next decade. However, that is not to say that it isn't high time there was such a thing, and I for one am looking forward to having such a universally-agreed standard, which everyone can then sign up to. But for now, I ought to get back to the original text of my book, which I interrupted in order to give you this 'newsflash'.]

Because of their fundamental differences and their inherent reluctance (some might say obstinacy) to co-operate, these two organisations – FSC and PEFC – are, in effect, in competition with one another over who is 'better' at certifying the forests and the chain of supply of forest product. So that means you will now find PEFC-certified forests in most parts of the commercial world of forestry and no longer exclusively in Europe and Scandinavia. Likewise, the FSC has expanded out its original 'heartland' of the tropical rainforests, where it first began; and it is now pretty well established on the temperate forest scene too; with a good proportion of Swedish, Canadian and other northern hemisphere forest areas under FSC certification. Temperate hardwoods too, are being FSC-certified: and the UK's own Forestry Commission also has its woodland production sporting the FSC badge. (There is more on the Forestry Commission's approach to certification – called UKWAS – later in this chapter).

3.8 Other Chain of Custody Certification bodies

Although FSC and PEFC are the best-known ‘brands’ in the field of Chain of Custody Certification, there are some others in the world, as I remarked earlier. North America has two: one for the USA and one for Canada.

In the USA there is the SFI – the ‘Sustainable Forestry Initiative’ – and in Canada, the CSA Scheme; the latter is so called because it is backed by the Canadian Standards Association. Each of these schemes relates, at least in theory, to both hardwoods and softwoods; but in practice, so far as supplies to the UK are concerned, the SFI is seen mainly linked with temperate hardwoods, as shipped under the NHLA grading rules; whereas the CSA scheme is used primarily for graded softwoods. But even though those two countries have their own ‘domestic’ Chain of Custody schemes, you will also find wood being sold with either FSC or PEFC certification from the USA and Canada too, as I shall explain in more detail when I talk about the UK government’s Timber Procurement Policy, or ‘TPP’ (‘Oh no! Yet another acronym’, you cry in despair!).

As far as tropical hardwoods are concerned – and putting aside for the moment the special case of Indonesia and their SVLK Scheme (which of course is primarily about legality and not about sustainability) – the only other Chain of Custody scheme worthy of note here is the one that is run by the



Figure 3.6 The SFI logo stamped on softwood from the USA.

Malaysian Timber Certification Council. Their Malaysian Timber Certification Scheme (MTCS) began in 2001. These days – and certainly as far as exports to the EU are concerned, Malaysia has reached an agreement with the PEFC (as from 2008) which now means that all fully verified Chain of Custody shipments from Malaysia will be badged as ‘PEFC certified’. So we shall not be seeing any actual MTCC/MTCS labels on any Far Eastern hardwoods brought into the UK from now on.

South American shipments may be approved by either FSC or PEFC, depending upon their country of origin and as far as I can establish, it doesn’t seem to be very common for those two main certifiers to operate within the borders of the same country; at least, not when they are working outside of Europe.

3.9 UKWAS

There is one notable exception to the much-discussed lack of co-operation between FSC and PEFC and that is in respect of the UK’s own forests. When the whole vexed question of Chain of Custody Certification of the UK’s nationally-owned and managed forests first arose, the Forestry Commission approached both of the major certifiers and – by some miracle of either diplomacy or coercion that I am not party to – got them both to agree to support something called ‘UKWAS’: or, in full, the UK Woodland Assurance Scheme.

This scheme allows *any* properly-run forest operation in the UK, whether it is overseen by the FSC or the PEFC, to be certified as ‘sustainable’: and then to be ‘badged’ as FSC timber, rather than as the organisation who certified the woodlands. (Maybe the FSC won the toss, in a secret meeting?)

3.10 Third-party assurance

My main message here, in respect of seeking assurance on the sustainability of timber supplies, is principally this. If you need to know that a recognised, third-party certification scheme has validated the timber as purchased for any project you’re connected with, in terms of its being legally and sustainably sourced (within the parameters of whatever scheme that may be), then there is something available which should satisfy everyone. But please remember not to ask *only* for ‘FSC’ when what you really mean is ‘certified’ timber – because,

apart from anything else, doing that will seriously restrict your timber supply options.

3.11 How Chain of Custody schemes operate

Having now told you the 'Who', the 'How' and the 'Why', I ought to tell you a little more about the 'What' – in respect of the guiding principles behind Chain of Custody Certification. And the clue to its operation is contained in the name. The whole thing works on the basis that every company which deals in one or more of the aspects of getting timber from the forest to the final user, is regarded as being a separate 'link' in the overall 'chain' of supply. Therefore, each of those links is required to prove – by means of different, but appropriate, tracing mechanisms (bar-coding, pack labelling and so forth) – that it has kept its consignments of sustainably-grown (and, of course, legally harvested) timber completely separate from any other timber stocks that it may also be dealing with. And all of those links in the chain begin right at the forest itself, so that any forest owner – be they state or private – must prove, to the satisfaction of the Certification Inspector (from PEFC, FSC, or whoever), that all of the 'right' things are being done to look after the forest habitat, the indigenous peoples, and so on and so forth, before any of the trees are even allowed to be cut down.

After that, the contract hauliers, who take the felled logs out of the forest and take them off – in the usual way of things – to the sawmill for processing, must also be a part of that very important Chain of Custody. So they too must be 'vetted' and given their own certification documentation; in order that they can pass on that 'sustainably grown and harvested' timber to the next link – generally a sawmill, as I said. And that sawmill must then be separately vetted and certificated, and so on, all the way down the line, through the importer, to the final seller of the wood goods. Which is why – if you are specifying or buying 'Chain of Custody Certified' timber for any job – you must check that the company which you are finally dealing with, are themselves fully certificated too. Otherwise, that timber (in spite of any labelling which may appear on the packaging) can no longer claim to be 'certified'.

To illustrate that point: I have come across many examples of timber merchants claiming that they 'stock certified timber', only to find that what they really mean is that they buy packs

with some sort of certifier's logo or labelling on them, and then sell them on, just as though they were still coming from within an unbroken supply chain. And yet they (the merchants) themselves have in fact broken that very chain, by not having a valid certificate of their own, to demonstrate that they have not (either accidentally or deliberately) cross-contaminated the 'certified' material with some non-certified material. Such a state of affairs is known as (surprise, surprise!) a 'Broken Chain of Custody'. And it happens with surprising regularity, although, largely through ignorance, people still seem to be getting away with it. (I will return to the question of a 'broken chain' in a later chapter.)

If a situation should arise in regard to a query over whether or not a particular 'chain of supply' is valid, and it needs to be resolved in some way, then that situation may be dealt with by recourse to yet another body: and this one is called CPET (pronounced 'Sea-pet'). I intend to deal with CPET fully in the next chapter, when I cover the ins and outs of the government's TPP, which I mentioned earlier.

So where are we now? As far as a buyer or specifier of timber is concerned, making sure that the final seller of the wood product is also properly part of the same (valid) Chain of Custody scheme is vital: and it is a point which specifiers and users can easily forget about, or misunderstand. But the process really needs to be enforced, if the whole concept of having some independent proof of 'sustainability' is not to be negated by falling at the very last hurdle. And after all – it is so easy to check up on.

Every member of a particular 'chain' (PEFC, FSC, etc) should have their own, unique 'C-o-C' number, showing their Chain of Custody licence (and some may have more than one – especially if they are stockists of both FSC and PEFC certified materials). So if you want to check up on a company, then simply log on (I'm sorry – but I can't resist adding a comment to say that the term 'log on' has never been more apposite!) to the main certifier's website and then look up the validity of the member company and/or their C-o-C licence. And it really *is* that easy.

Now I need to deal with some of the actual regulations relating to the trading of timber, in more detail. I also need to tell you quite a bit more about the various regulatory and quasi-governmental bodies who exist, to help with – but also to 'police' – this whole process.

4 The UK Government and European Regulations: Legally Trading in World Timbers

4.1 Checking up on the checkers: The role of CPET

There is a very helpful organisation – which I referred to very briefly in the previous chapter – that exists in the UK specifically to help specifiers, buyers and others who wish to use timber on a project and who want it to be ‘sustainable’. This organisation helps to unravel what is, or what is not, a valid claim about the ‘sustainability’ (and also, just as importantly, the legality) of the chain of supply of any timber or wood-based product. It is a completely independent and impartial body, funded by government; and it is known as the ‘Central Point of Expertise in Timber’ – or ‘CPET’ for short. Its funding comes directly from DEFRA and the current CPET ‘operator’ is an organisation called EFCA. They took over that role in late 2012 from the previous incumbent, who had run CPET for a number of years since its inception; and that former operator of CPET was a consultancy company known as Proskills.

One of CPET’s very important roles is to evaluate claims about Chain of Custody and sustainability; and especially the claims that are made – usually in reams of paperwork – by suppliers at all stages of the supply chain. And CPET will attempt to give guidance on what is valid and what is not, in terms of full ‘sustainability credentials’. And if that is not possible, they can help to establish the nearest available equivalent – as I will explain more fully later. Wherever

possible, CPET will aim to give reassurance that a statement which is being made about the supply status of any particular timber or wood product is in fact genuine. You may be interested to know that it was CPET – under the aegis of Proskills at that time – which formally recognised the five Chain of Custody schemes which I outlined in Chapter 3. They (CPET, that is) decreed that these five schemes were fully acceptable within the UK, in terms of providing realistic ‘proof’ of legal and sustainable timber stocks coming from designated sources. However, that ‘blanket recognition’ has since been modified a little, as I will explain in the course of this chapter.

4.2 CPET’s help with legality and sustainability requirements

There are many questions around the whole field of ‘sustainability’ which CPET can provide help and answers to. Such as: ‘What if the timber being offered or sold to me is only classed as “legal” but it is not fully “sustainable”?’ Or: ‘What if there is not a fully documented Chain of Custody scheme operating in an area where the timber is being obtained from?’ CPET can certainly assist specifiers or users with those matters, as I will explain shortly, but its primary role is to spread an understanding of the government’s Timber Procurement Policy – or TPP – which I referred to very briefly in Chapter 3 and which I will expand on now.

CPET presently recognises two separate levels of compliance with the UK government’s TPP and its declared and desired aim of ensuring that as much timber as possible – when it has been used to satisfy a government contract – has in fact been obtained from sources that are *both* ‘legal’ and ‘sustainable’, within the precise definitions of those two terms, as they are defined on the government’s own website.

Those two levels of compliance with the TPP are known (quite straightforwardly) as ‘Category A’ and ‘Category B’ respectively: but before I go any further into what they are, I should first of all give you the government’s own definitions of ‘legal’ and ‘sustainable’ – especially since their version of ‘sustainability’ differs somewhat from the basic dictionary definition that I put to you earlier.

4.3 Legality and sustainability: The UK government's definitions

According to CPET, all central government departments, their executive agencies and all non-departmental public bodies, are now required to procure 'timber and wood-derived products' (in their own rather cumbersome phrase) that have originated from *either* 'legal and sustainable', *or* 'FLEGT-licensed or equivalent sources'; *or* to use 'recycled timber'. (I should make it clear here that it is only government departments that are required to strictly follow these guidelines on 'going green': because all local authorities, schools and the NHS – whilst closely tied to government funding – are not actually *obliged* to follow the TPP, although they are being strongly encouraged to do so.)

Be that as it may, the exact definitions of 'legal' and 'sustainable', within the context of the UK government's Timber Procurement Policy, are as follows.

4.4 Legal timber sources – the UK government's definition

For UK government procurement, 'legal timber and wood-derived products' are those which originate from a forest where *all* of the following requirements are met:

- The forest owner/manager holds 'legal use rights' to the forest.
- There is compliance by both the forest management organisation and any contractors, with local and national legal requirements, including those relevant to:
 - Forest management
 - Environment
 - Labour and welfare
 - Health and safety
 - Other parties' tenure and use rights.
- All relevant royalties and taxes are paid.
- There is compliance with the requirements of CITES*.

*For the definition of, and a fuller explanation about CITES, see later in this same chapter.

4.5 Sustainable timber sources – the UK government's definition

For the purposes of satisfying any UK government procurement procedures, all 'sustainable timber and wood-derived products' must come from a forest which is managed in accordance with a definition of 'sustainable' that meets all of the following requirements; and also where the definition of 'sustainable' must be consistent with (in their words) 'a widely accepted set of international criteria' defining:

- sustainable or responsible forest management at the forest management unit level;
- it must be performance-based; meaning that measurable outputs must be included;
- management of the forest must ensure that harm to ecosystems is minimised;
- management of the forest must ensure that productivity of the forest is maintained;
- management of the forest must ensure that forest ecosystem health and vitality is maintained;
- management of the forest must ensure that biodiversity is maintained.

Phew! There's quite a lot there to go at. So how does CPET actually go about checking whether any particular claim of 'legal and sustainable timber supply' is a valid one? Well the first thing to establish is whether or not it can be defined as 'Category A' or 'Category B'.

4.6 Category A and Category B – 'Proof of Compliance'

Category A is the relatively easy one. If any of the timber and wood-based products have been offered under the aegis of a recognised Forest Certification and Chain of Custody scheme (that is, so far as the UK is concerned, essentially FSC or PEFC), then they will be *deemed to satisfy* the UK government's current Timber Procurement Guidelines. But I will introduce a word of caution here: even though it may look like everything is very neat and straightforward. Having purely and simply a 'Chain of Custody' certificate for each stage of the *supply chain* does not cover everything that is required. It is a requirement that the *forest* itself, from which all the timber was originally harvested,

must have its own 'Forest Certification' documentation too. So, for full Category A compliance, the final timber supplier – at the bottom end of the 'chain' – to that elusive government contract needs to show that they have in their possession, fully valid documentation for *both* the forest *and* the entire supply chain in all of its many links.

I said a bit earlier on that CPET does not now give 'blanket recognition' to all of the sustainability schemes around the world (which are currently five in number, as I mentioned previously). The situation now is that, in effect, the FSC is more or less a 'stand alone' scheme; and it has become the job of the PEFC – under its newer title of the 'Programme for the Endorsement of Forest Certification schemes' – to act as the 'umbrella' scheme for any of the others, especially insofar as the UK is concerned. Therefore, the SFI, the CSA and the MTCC (all of which are described in Chapter 3) will now all bear the PEFC logo on any of their 'approved' timber and wood-derived products which are on sale in the UK, rather than carrying their own 'domestic' logo and other descriptors, from their specific country of origin. So, in effect, the only two Chain of Custody schemes which CPET will now recognise on behalf of the UK government, are FSC and PEFC.

So what happens if there is a break, somewhere in the 'approved' supply chain from forest to final customer, which cannot easily be rectified? (For example, if a particular forest area does not come under one of the 'recognised' schemes; or if a particular shipper of a required species of timber is discovered to be not fully C-o-C licensed.) In such a case, CPET will then attempt to evaluate whatever paperwork can be made available: such as government licences, supplier declarations, and so on; and they may then allow the timber to pass through with a 'Category B' recognition. But be warned: achieving Category B is not that simple!

Category B is not necessarily – despite its lower grade-sounding designatory letter – a 'poor relation' to full Chain of Custody Certification. It is simply an alternative; but one which is obviously a lot harder to 'prove'. But it is nonetheless a perfectly valid 'proof', as, when and if CPET has finished its evaluation and given it a favourable ruling. Of course, there are things which any Category B 'allowance' must have, and naturally, the *legality* of all log purchases and supplies is paramount – or else, no approval can ever be given. However, full membership of a recognised certification scheme, all the way down the 'chain' may not be completely insisted upon, where other satisfactory parameters can be shown and proven to operate.

Essentially, to meet Category B compliance, the final timber supplier (to the government contract) must have what CPET defines as 'credible evidence'. This must show – in CPET's words – 'robust traceability' of the product, as well as the fact that the timber's original forest source meets all the criteria for legality and sustainability *and* that any such 'credible evidence' has also been properly and independently third party verified in some way, and it thus more or less equates to FSC/PEFC standards of proof. So getting Category B approval is not really so easy, after all.

Of course, whenever there is a realistic possibility that supplies of a particular wood species can be bought under full Category A recognition (Chain of Custody all the way), then CPET will try to encourage suppliers to move to that alternative. But sometimes, supply chain limitations, or shortages of certain species not being available from fully C-o-C certified forest areas, will mean that Category B recognition is the best that can realistically be obtained – at least for the time being.

4.7 Current and future supplies of certified timber

Much of the landscape (metaphorically speaking) which surrounds the whole issue of sustainability of timber supplies, is changing all the time, and so wood species which were not available in the form of fully-certified supplies even as little as five years ago, are now appearing on the market with all of the proper credentials. And of course – though it is a fact that is not often understood by either specifiers or suppliers – there is the very helpful ruling that any reclaimed or 'second-hand' timber products will automatically qualify as fully Category A materials. In other words, their 'Chain of Custody' has already been established, by the simple fact that the timber had been harvested and made into something (floor joists, pallets, or whatever) some considerable time ago; and often before any of the present 'legality' restrictions were in place. (See Chapter 5 for more on this.)

However – and notwithstanding anything else which is required – there is still that thorny issue of 'legality' to be satisfied, in most of the cases concerning the timber that is being sold at the moment. And that basic requirement is still there, even without the extra level of attainment in the supply and specification of any wood for any job, which is its 'sustainability' – and which of course is a very desirable aim (and after all, it is the theme of this book). But we have to start somewhere; and the question of legality needs to be tackled first and

foremost, if the world's forests are not to disappear, simply by being shipped 'out of the back door' so to speak.

Which brings me on rather neatly to discuss the new (and in actual fact, *very* new – as of 2013) law which has just recently hit us. And that is the 'EUTR', which I have already mentioned a couple of times, with the promise that I would soon be explaining all about it. So here goes.

4.8 The EUTR: Europe's new and compulsory 'timber legality scheme'

In 2012, the European parliament passed into law the 'European Union Timber Regulation', known universally for short (and thankfully) as the 'EUTR'. This, as its title clearly says, is a 'regulation' so it is not merely a 'directive' (something far less onerous) which EU governments are at liberty to 'opt out' of if they want to. No, it is a proper Law with a capital 'L': and as such it carries with it criminal penalties for anyone who is found to have contravened it. These penalties can include the confiscation of all non-compliant timber stocks, large fines, and even, potentially, the imprisonment of individuals who may be caught trading in timber and wood-derived products that are deemed to have been obtained illegally. By which is meant, having been harvested without the appropriate logging licences and where relevant, export permits as well. I have said 'where relevant' in the case of export permits, since this European regulation applies just as much to all timber *grown within* the EU as it does to any timber *imported into* the EU, from any other non-EU countries. It is a fact that we even have to prove that our *own* timber, grown here in the UK, has been legally harvested and that we have official permission to cut it up and sell it!

The EUTR – as with most other EU legislation – was given an introductory timetable; that was effectively a period of grace, to allow timber traders within the EU to get used to the idea that it was coming along. And that introductory period expired, back on 3 March 2013. So the EUTR is with us now – at the time of writing – and it looks as though it is here to stay; even though the UK, among many others of its EU partner countries, seems to be only partially ready for it. Let me explain my currently 'lukewarm' response to the way in which the whole thing appears to be going at the moment.

In April 2012, after it was publicly known that this would become EU law within a year, I tried to find out which government department had been designated to deal with the EUTR: but

I couldn't find any mention of it on any government website. Eventually, in about late June 2012, when there was something in the order of less than nine months to go before it became a law that we all had to obey, I discovered that the government department, known as DEFRA, had finally been given overall responsibility for administering it. But even then, no government-controlled 'body' had been appointed to actually run with it and make it work in practice. That last and – to my mind, most important – step was eventually taken in about late July 2012, when it was announced that the National Measurement Office, or 'NMO' (and no, I'd never heard of it before, either!) would be taking on the responsibilities of managing the EUTR. Are you still with me? – I hope so!

One of the first of those 'responsibilities' that the NMO was given by DEFRA was the appointing of 'monitoring organisations', or 'MOs' (I do hope you're still keeping up with all of these acronyms); and these would be 'approved' to check that all timber traders, importers, merchants, and so on, were carrying out the required 'due diligence' exercise. I will be telling you more about what that entails, in a while. It was envisaged that the duties of an MO would include checking whether the 'traders in wood' were filling out the appropriate paperwork and were keeping all of the records needed, to then show that they were not harbouring any illegal timbers amongst their stocks. However, as at the end of February 2013 – that is, about a week before the EUTR was due to be enforced as 'the law of the land' – there was not a single 'approved' monitoring organisation to be seen anywhere on the DEFRA/NMO website, or indeed on any UK government website at all. And I have since learned – from talking about this with my contacts at CPET – that the approval of even the very first MO within the UK, is not likely to happen before about the middle of 2014, by which time, the EUTR will have technically been in force and theoretically being checked, for something over a year! (Don't fret about it too much at this stage: I will deal with how a company's compliance with the EUTR can be 'proven', in just a short while.)

[I find that I now need to add a short 'update' on the state of preparedness generally, for checking on 'due diligence' across Europe. And that is because I have – as of late summer 2013 – just been working in Germany, on various certification matters: and I can now report that Germany is not so very far ahead of us; which makes a nice change. It transpires that Germany is

also waiting for the appointment of at least one nationally-accredited monitoring organisation, just as we are here in the UK and the likely candidate over there is the German equivalent of our own Timber Trade Federation. This body goes by the delightfully teutonic name of the 'Gesamtverband Deutscher Holzhandel' – which translates as the German Timber Trade Federation – and this organisation is expected to become accredited by the German government around the end of 2013.]

[STOP PRESS! Just as I was about to hand in the manuscript for this book, in September 2013, it was announced that the European Commission had just appointed the first two monitoring organisations – 'MOs' – that have been approved to help companies in certain EU member states to comply with the EUTR. Those newly-approved bodies are the Danish-based (but internationally operating) organisation called 'NEPCon' and the Italian organisation known as 'Conlegno'. The name 'NEPCon' stands for 'Nature, Ecology and People Consult' – and they describe themselves on their website as 'a partner of the Rainforest Alliance', whereas 'Conlegno' ('legno' being the Italian for 'wood') was set up by the Italian Wood, Furniture and Cork Association – known in their native tongue as 'FederlegnoArredo'. It is worthy of note that the press release which announced the appointment of these two organisations says that working with an MO is 'voluntary'; and that even co-operating with an MO does not exempt timber traders from any liability, or their legal obligations under the EUTR. So that is now pretty clear, the European Commission intends to make the EUTR stick! (I did tell you at the start of this book that things were very much liable to change quite rapidly – and this is proof of that very prediction. However, I don't pretend to be clairvoyant; so I can't tell you who will be appointed next, or how many MOs there might be, by the time this book hits the shelves!)]

4.9 The meaning of 'due diligence'

Now back to the matter in hand: I have just mentioned – twice in this chapter alone – the words 'due diligence'; and that happens to be one of those phrases which bureaucrats (and also lawyers) love to bandy about. It crops up in all sorts of walks of life; especially in things like banking or accounting; where those persons, or corporations, involved in buying companies

or launching major stock issues for example, are supposed to check that everything ‘looks OK’, and that some sort of appropriate investigation has been made into matters of propriety, honesty and the like.

Well, something not too dissimilar is also meant to be done in respect of the EUTR. This new law requires that anyone who is the so-called ‘first placer on the market’ of any items containing wood, must have made appropriate checks as to the legality of that wood’s provenance. And that ‘first placer’ (who may be a timber importer, a forester, a furniture manufacturer, and so on) has to have their own appropriate ‘due diligence’ paperwork, all of which must be available for inspection by anyone empowered to do so; and it must certainly be capable of being checked by the NMO – or by an approved monitoring organisation, as authorised by the NMO, if so required. That is, if the relevant ‘first placer’ can actually find an MO in the UK to check their paperwork for them.

But what if a company’s due diligence paperwork is not there; or it isn’t correct, or it’s not fully complete? Well, Dear Reader, it is a bit too early to tell; since to date (i.e., at the time of writing), there have been no confiscations of wood goods or prosecutions of companies. But in theory at least, any or all of the penalties that I outlined earlier, could be brought to bear on those who are found guilty of not working correctly to the EUTR. That’s not to say that the wood itself may have necessarily been obtained in any underhand way, but it must, at some stage early in its ‘life’, have been *proven* to be sourced from somewhere where permission to fell the trees had been officially given, and – just as importantly – there must be a logging licence (and also, if necessary, an export certificate) made available for scrutiny by someone in authority. If those vital documents are not there, then someone on the timber supply side could be, metaphorically speaking, for the high jump.

4.10 Satisfying the EUTR

So how can someone actually satisfy the EUTR and get themselves a ‘workable’ due diligence system in place, to show that all of their timber purchases are ‘correct’ and have therefore been correctly and legally obtained? In the UK, one of the most straightforward ways could be to satisfactorily complete the paperwork of the Timber Trade Federation’s Responsible

Purchasing Policy (RPP) which I have discussed in some detail in Chapter 3. (As I write this section, it is expected and even hoped by some, that the TTF may become the first – if not the only one in the UK for some time – approved monitoring organisation under DEFRA and the NMO; so it is a very similar picture to that which presently obtains in Germany, in some respects at least.)

However, the ‘fly in the ointment’ is the fact that not everyone who buys and sells timber and wood products in the UK is a member of the TTF; and nor do they necessarily wish to be so, just so that they can satisfy the EUTR. And indeed, many ‘first placers’ of timber on the market would not really come under the scope of the TTF; whose members are almost exclusively those who simply buy and sell raw (i.e., unprocessed) timber. There are many large joinery manufacturers and DIY or furniture chain stores, for example, who import machined timber or manufactured wooden items, often from sources outside the EU. So for non-TTF members, what else is there which could be done if they either can’t – or don’t wish to – use the RPP documentation?

Eventually – or at least, so it is currently assumed – some further monitoring organisations may become recognised and approved to operate under DEFRA’s remit: but, as I write this, there are no other UK-based candidates apart from the TTF currently ‘on the horizon’. (Bearing in mind that I have said this book is more or less a ‘position paper’; so that things can and must change within a year of so whatever I set down here: it’s not immutable.) But since there are a good many timber buyers and sellers who are not, or who don’t want to be, members of the TTF, then there are no ready-made forms for them to fill in: so that leaves them with a much more ‘DIY’ approach to due diligence. However, they can always get some help from other parties (such as independent consultants) who perhaps might know a bit more about it.

It is a fact that – currently – there is no specific, laid-down requirement under the EUTR (and nor is there from DEFRA, either) to have one’s due diligence paperwork fully checked off and then approved by a monitoring organisation: even supposing you can find one. But in any case, even were there to be such a requirement, the National Measurement Office as it is currently funded, is simply not set up to be able to do that sort of ‘universal checking’ job. It is therefore – both in my view, and in the view of certain others ‘in the know’ – a perfectly valid option for any person, timber trader, importer or company

who finds themselves in the position of being one such 'first placer on the market' of any timber or wood-based goods, to set up their own in-house due diligence system. And so long as that system works reasonably well and so long as it is clear and logical; *and* so long as it is written down somewhere (even electronically) in an understandable format; then that would seem to be as much as is required under the present interpretation of these regulations.

Assuming all of that paperwork and recording to have been done properly, then – if such a company or individual should then be required to submit their documents for scrutiny (perhaps eventually as a result of any investigations or enquiries) – they could then do so, direct to the NMO; in the hope and expectation that it would be approved. And as yet, especially given the lack of any other clear mechanisms and procedures so far in place, that 'fallback' position would seem to be the best option available – if not indeed the only one.

But one thing definitely *is* certain, however. Simply doing nothing and just hoping that it will all go away, is *not at all* a sensible option! And in my own view, this is why. It is very



Figure 4.1 Some headlines from the TTJ in 2013 about 'illegal' timber supplies and the EUTR.

likely that the ‘greens’ (which, as you know by now is my catch-all name for all of the different groups of environmentalists and others with either or both an ecological or a political agenda) will be keeping a close eye on EUTR matters over the next year or two, in the expectation that someone will not have bothered about completing the necessary due diligence paperwork; or will be hoping that the whole thing just gets ignored for a very long time. And then, no doubt, they (the greens, that is) will be more than happy to make an example of such a company or individual (and preferably a big-name company) in the national press; in the hope of bringing a high-profile prosecution under the EUTR: which, as I keep saying, is a European – and thus also a UK – Law.

So, in order to avoid just such an uncomfortable and embarrassing eventuality, how should anyone go about setting up their own simple but workable due diligence system?

4.10.1 *Putting together a due diligence system*

At its most basic, the simplest and most foolproof method would seem to be to restrict one’s purchases to only buying timber products from properly Certificated Chain of Custody sources (as validated by PEFC or FSC), but even then, one would still need to be very careful. Simply having proof of a third party approved ‘Chain of Supply’ is not necessarily a guarantee of satisfying the EUTR: which may come as a bit of a surprise, at first hearing. I know that a lot of people have simply assumed that if they have PEFC or FSC Certificates for their timber stocks, then everything must be ‘done and dusted’ – but that’s not necessarily so. What is also needed – as I have said elsewhere – is proof of a valid ‘Forest Certification Scheme’, to show that the trees themselves were correctly and legally obtained, even before they got into the rest of the usual timber supply chain. And that of course is a different and completely separate requirement from just proving the validity of your own timber supply chain, only starting at the sawmill.

Having taken care of that little matter, and assuming that all of the required Chain of Custody documentation (of both types: forest *and* supply chain) is in place; then everything should now be fine in theory. But that situation holds *only* if all of the relevant goods are fully covered by valid Chain of Custody Certificates. If there are any of the supplying company’s products (but only where that company is the ‘first placer on the market’ of such products, remember) that

do not – or cannot, for some other reason – have any valid C-o-C documentation, then something else of an equally ‘valid’ nature must be provided instead. And that ‘something else’ can be quite varied in its scope and content.

The next simplest thing to do in order to ‘prove’ compliance with the EUTR (and in many ways, it is more or less on a par with the C-o-C ‘proof’ mentioned above) is to get a FLEGT VPA Licence, which covers all of the relevant timber, and which has been properly obtained from the relevant exporting country. In fact, one school of thought has it that a FLEGT VPA Licence is actually *better* than a Chain of Custody Certificate; since FLEGT must, by its very operation, include the legality of the forest practices as a normal part of its scope: thus satisfying the ‘legality’ requirement all the way from the forest. (And of course, there is also the new Malaysian process, known as MYTLAS, as described in Chapter 3.)

Finally, in the absence of either of the above (preferred) documentation schemes, then one needs at the very least to have some meaningful ‘supplier declarations’ in place, amongst one’s due diligence procedures and records. These particular pieces of paper – and I hesitate to call them ‘documents’ since they have very limited legal status – are normally obtained from the ‘supplier’ who is providing the timber or wood goods to the EU-based purchaser. And they must state, in quite a robust and clearly traceable way, that all such timber and wood goods have been obtained in a legal and consensual manner; with all necessary national rules and regulations obeyed, and all of the required local certificates having been properly obtained.

What will *not* be acceptable in any way, however, is just some very basic and generic version of a piece of paper (*literally* a ‘piece of paper’ – since that is about all it is worth!) which may be referred to glibly as a ‘certificate’, but which has in fact just been pestered out of one of the suppliers a bit further up the chain and which says a bunch of words to the effect that: ‘All our timber is sourced from legal and sustainable sources, in compliance with National Laws...’. But I’m sorry to have to tell you that something as trite and as basic as that last form of words is just not a good enough effort to demonstrate that proper ‘due diligence’ has been followed. And such a ‘declaration’ will certainly not wash with the NMO, or anyone else in authority, in the event that the supplying company’s ‘legality’ claims should ever be investigated more deeply. It is absolutely the case – and it will only become more necessary as time goes

on – that there must be really, really credible evidence to show that some reasonable attempt has been made to ‘get behind’ a supplier’s ‘smokescreen’ of words; and to actually find out whether his claims have any merit or whether they are merely empty words on a scrap of paper, that have no validity or substance to them.

After all, that is what the term ‘due diligence’ really means: that someone has been *diligent* (i.e., very thorough) in trying to find out the truth about what they are buying and that they have not just been ‘fobbed off’ at the first attempt with feeble excuses or meaningless bits of paper (or, these days, PDFs sent electronically). However, on the other side of the coin, let me be clear: the EUTR does not expect the buyers of timber to be veritable courts of law in themselves. But it does at least expect them to have asked the right questions of their suppliers, and to have looked a bit further and a bit deeper than the first ‘keep ‘em happy’ statements that have been received – and which may well be backed up only by fairly poor and obvious forgeries.

4.10.2 Maintaining the due diligence system

Having thus established all of the necessary paperwork and – equally importantly – kept adequate files of written (or computerised) records, so that the ‘first placer’ has at least ‘proved’ that they are doing everything properly; they must then make sure that their due diligence system is being continually kept up to date. So it is not just a ‘one-off’ exercise that can be considered as having been ‘done’; and then it is just put away on a shelf or in a drawer (or inside a computer disk drive) and then promptly forgotten about!

The sorts of things which one needs to be aware of – and needs to keep abreast of, as well – are such matters as changes in the company’s product portfolio. For example, if a timber trader always and ever only imports just one or two different species of timber, for use in a small range of products (let’s say, European redwood or European whitewood as roofing battens), then it is unlikely that they will need to make many changes very often ... although they still might! If their ‘usual’ sources of those two relatively straightforward softwoods – either in the form of logs or maybe as sawn boards – should change: perhaps from Latvia (say) to the Ukraine, then it must be ensured that any ‘new’ source is also proven to be legal and valid (by reference to the CPI, perhaps); and then

the company's own due diligence documentation must be amended and updated accordingly.

So, if even a relatively minor thing like a change of timber supplier for just a single product requires a wood-goods trader to keep on top of things, then think how much more work will be involved, where the products are many and varied and where they are made from a whole *range* of different timber species or many types of wood-based materials.

There was a recent case (early in 2013) where a world-renowned manufacturer of guitars was heavily fined, and their stocks of certain very expensive (and also very rare) tropical hardwoods, as used for fretboards, inlays and the like, were confiscated. Now I know that the example of a guitar (or any other musical instrument) maker is perhaps at the other, more extreme, end of the scale from roofing battens; but the point is still well made: any product that is manufactured or assembled out of more than one type of timber, or that is made from timber coming from more than one possible source, is going to require *constant* attention to the due diligence system; in case there are new or altered legality issues which have to be addressed.

But even where the trader has not made any particular changes to the specification or the sourcing, for the goods they are presently selling, it is possible that other events may have conspired to require them to update or amend their documentation. A supplier further up the line, who was previously 'bona fide', may have had their own Chain of Custody Certificate withdrawn because of some non-compliance issue. (Not too long ago, Latvia had its Forestry C-o-C Certificates temporarily withdrawn – in 2010/2011 – owing to a number of relatively minor issues, but that led to a wave of potential problems for those who required their Baltic softwood to be fully C-o-C Certified.) Or perhaps, a particular timber species may have been newly added to the CITES list (I'm going to explain all about CITES soon); meaning that something which was formerly okay to trade in, has now been severely restricted; or perhaps even banned altogether.

As I write this, there is currently no legal *requirement* for an 'annual update' of anyone's due diligence system, but common sense ought to tell you that keeping an eye on the system now and again wouldn't do any harm. Just in case the seller (or the company or the person from whom the wood goods were bought from in the first place) should be asked to 'prove' that everything is still in order and that nothing has changed which could adversely affect the system, as recorded.

4.11 Who actually needs to obey the EUTR?

When I first started writing this book, just before the EUTR was due to come into force, there was some considerable confusion about the applicability of the EUTR and who actually needed to have a due diligence system in place. Much of that confusion came about because of the incredibly slow start which was made by the UK government in establishing who would actually be responsible for ‘policing’ the EUTR in the first place, as I have described earlier in this chapter. But all of those sorts of things have at last become a little clearer, in the past few months, and they have slowly improved; ever since the EUTR actually became law in March 2013.

4.12 The ‘first placer on the market’

As I mentioned a little earlier, the EUTR uses the rather quaint phrase: ‘the first placer on the market’. This literally means the individual or company who *offers* something that has been made from any part of a tree (including the tree trunk) *for sale* anywhere within the borders of the European Union; *and also* where that individual or company is the one who actually introduced that wood-derived product into the EU marketplace in the beginning. (This person or organisation is also sometimes referred to as an ‘operator’ – which is another term that can have several meanings, and that is why I prefer to use the longer phrase: ‘first placer on the market’. It is somewhat cumbersome to keep repeating, but it is far less ambiguous.)

Any such ‘commercial entity’ trading in things made from wood, does not have to be the specific manufacturer of any wood-derived goods that are on sale in the EU. For example, with furniture that has been made in Thailand or Vietnam, and which may then be brought into an EU port, it will be the responsibility of the EU-based importer (or their agent, if that company is not itself domiciled in the EU) to see that the EUTR is being properly followed. And in fact, the ‘first placer’ doesn’t even have to be an importer – as I have said before – since the EUTR applies equally to domestic wood sources as well as imported ones. So if you happen to be lucky enough to own a small woodland in (say) some pleasant, rural English county; then you will still need to demonstrate that you have the necessary permission to cut down and sell even a single one of *your own* trees, if the timber from it is to be sold on to

someone else in any shape or form. And that ‘shape or form’ could be anything from the whole log, to a box of matches.

I would say, as things are now firming up, that the EUTR appears to mean business, especially in the UK, so my advice is that it would be best to make sure that everyone in the ‘wood chain’ obeys the rules as best they can, all of the time!

4.13 CE marking and the CPR

I now just want to say – fairly briefly – something about the role of CE marking of wood goods; although that is not strictly within the scope of this book; and nor is it part of the EUTR, nor anything directly to do with Chain of Custody. But it is a somewhat unfortunate coincidence of timing – so far as the UK is concerned, at least – that CE marking became EU-wide law only about three months after the introduction of the EUTR – in July 2013 – when the EU adopted the Construction Products Regulation, or ‘CPR’. (It’s just like buses: you wait years for one EU law on timber sales; and then two come along at once!) So there is – naturally – some confusion over what, if anything, needs to be done to satisfy the CPR and CE marking; as well as trying to deal with the whole issue of the ‘legality’ of our timber supplies.

But the ‘correct’ answer is that those two things are in fact completely different to one another: and simply displaying a CE mark on any wood-based product – such as a piece of strength graded structural timber, or a sheet of building-type plywood – does not then confer any sort of ‘legal’ or ‘sustainable’ status on those wood goods at all.

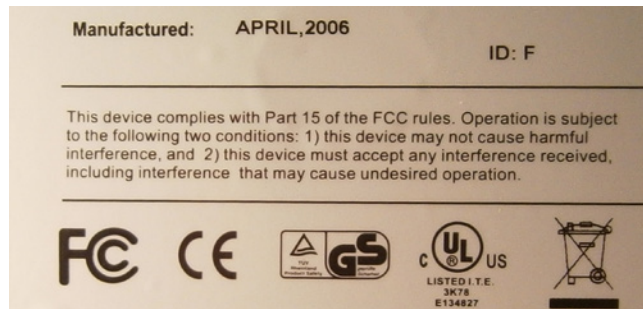


Figure 4.2 The CE mark gets everywhere – not just on wood goods – and it has nothing at all to do with sustainability.

By the same token, having a Chain of Custody logo or Certificate, in relation to (say) a pack of timber, does not at all guarantee that the said timber will meet any product-relevant or valid British or European Standards, or that it is of consistent or reliable quality. It is that latter attribute – good, reliable quality – which is supposed to be the purpose (if not always the actual fact!) of displaying a CE mark. So please treat those two ‘new’ EU laws in very different ways; and – for the purposes of this book *only* – put the CE mark out of your mind for now.

Now, just before I finish with this particular chapter covering the ‘rules and regulations’, I need to say something about the meaning and the role of CITES: as I promised to do, some few pages back.

4.14 CITES: What exactly is it?

I often come across people saying things like: ‘You can’t buy X (*insert the name of any exotic or less commonly used timber here*) anymore, because it’s now on the CITES list’. In fact – since I first wrote that line, and only as recently as the end of June 2013 – I was told categorically by a salesperson from one of the larger UK hardwood importers in no uncertain terms that: ‘I can’t get you any South American mahogany; I’m pretty sure it’s illegal now’. But that is not correct: and neither is it the whole story; because you really need to know *which* actual CITES list any timber is on, before you can know whether or not it is genuinely *illegal* to buy or sell any of that particular wood. So let me now clarify things a bit.

That somewhat charismatic set of initials ‘CITES’ (and yes, I’m sorry to say, it is yet *another* acronym) stands for the ‘Convention on International Trade in Endangered Species of Wild Fauna and Flora’ – although the last three capitalised words were added to the title more recently; hence the simpler, five-letter acronym that the world still knows it by. This widely-known, but largely misunderstood, world-wide body is responsible for publishing the so-called and oft-misquoted ‘CITES List’. And that list is what is so often given as the reason why something or other can no longer be legally traded. And yet there are actually *three* separate CITES lists (or ‘Appendices’ as they are more properly, and officially, called), and I will explain the differences between all three of them, as we go along.

CITES doesn't only cover some fairly rare species of timber, of course. It covers *any* species of plant or animal which is deemed to be 'at risk' of – or even worse, on the brink of – extinction. Some of the more famous examples of CITES-protected species are the white rhino and the Himalayan tiger; but many more even humbler things, such as sea cucumbers, are also included within the CITES appendices. And there are indeed quite a few tree species that are included in them, so that is where CITES sometimes directly impinges upon the commercial activities of the timber trade.

I will now give you a few examples of which timbers can and cannot be traded and why, but to do that, I first of all need to explain the three different appendices (or 'lists') which currently exist.

4.14.1 CITES I

This, you might say, is the 'big one'. It includes all of the species of fauna and flora that are presently considered to be threatened with extinction and any form of 'trade' in them is more or less prohibited. And what little 'trade' (if you can even call it that) that is permitted, is only allowed in limited and exceptional circumstances. Such 'exceptional circumstances' are likely to be the movement of individual specimens, as collected for reasons of breeding (more usually in the case of fauna), or for keeping in a seed bank (often in the case of flora), for example. And obviously, any commercial timber trading in any of the tree species on the CITES I appendix should definitely never happen, under the present rules and in the present day.

I say 'in the present day'; since there has been a long and historic trade in many of the tree species that now find themselves on CITES I; but which took place over the past few centuries, before any rules were ever in place. The various 'rosewoods' are a classic example of this, where certain timbers were prized for their decorative appearance and were used in furniture and cabinet-making, and so on; but which nowadays are prohibited from such use. (Of course, if you have a piece of antique furniture containing – say – Rio rosewood, nobody is going to come round to your house and confiscate it! But if you try to export it, then you will have to show all sorts of proof that you came by it legally and that it is a genuine antique and not a modern reproduction, that might possibly have been made from illegally-obtained wood. And it is a fact that classical

musicians, travelling to concerts around the world, have been seriously questioned about their violins and cellos and some musicians have, in some instances, had their instruments impounded or have been threatened with having to pay some form of 'duty' on them. So you can see that the question of 'policing' the CITES I species is not just an abstract thing: it is very real and genuine, in the twenty-first century.)

4.14.2 CITES II

This next listing is still quite strict; but it is nowhere near as strict as CITES I. This appendix includes species that are not necessarily threatened with immediate extinction; but it does require any commercial trading in such species to be controlled, in order to avoid any form of commerce or utilisation in particular species which is, as the wording goes, 'incompatible with their survival'.

Insofar as any commercial trading in timber species on the CITES II list is concerned, that is actually allowed; but there are a number of requirements that have to be met before it will be permitted. For this and certain other reasons, many timber traders prefer to steer clear of such potential problems. But for anyone to say of any timber that it is 'on the CITES list' and therefore cannot be bought and sold *at all*, is just not true, when that timber is actually on the CITES II list (and this also applies, of course, to the CITES III list, which I will cover next).

Trading in any CITES II species may in fact be permitted, if that species was legally obtained; if it also has a valid export permit; and if its export will not be detrimental to the survival of that individual and named species. Unlike any of the CITES I species, no specific import permit is required for a CITES II species – unless separately required by the national laws of the importing country for whatever reason (maybe only for customs duty, perhaps). And, whilst the wording that covers the CITES I listing specifically states that an export permit may be issued 'only if the specimen is not to be used for primarily commercial purposes'; there is no such wording covering the CITES II listing, which explicitly prohibits commercial sale, so long as the species was legally obtained and it has all of the correct export documentation. And, just to make the point even more strongly, CPET is of the same opinion (I checked with them about that very thing before I said so in this book).

4.14.3 CITES III

This list is, in effect, a 'CITES II list in waiting'. It contains species which are protected in at least one country: and those particular countries, that now wish to extend its protection in the wider world, have asked other signatory countries to CITES to help with limiting the trade in those named species. But such limitations are *voluntary* and cannot be legally enforced by any outside agencies (or even by CITES itself), if any other trading country does not wish to limit the trade in its own 'home-grown supply' of those actual species. A good example of this is ebony, which is currently on the CITES III list, having been put there by Madagascar; but which is not yet 'banned' by any other African state. (But I should at least report that there are strong moves afoot, as I write this, to have ebony moved up to the CITES II list, so the situation may well have consolidated by the time this book hits the shelves).

4.14.4 CITES-listed timbers

I said that there are some wood species which are 'on the CITES list', and Table 4.1 below gives a number of timbers that are on the *different* CITES lists (Appendices). This information is valid as at autumn 2013, which is the latest data that I have been able to source during the writing of this book. I have not included in the table some of the really rare and 'non-timber trade' woods that are listed; I have only bothered to mention those which have been used and popularised in the UK over the past few hundred years or so. For a comprehensive set of all the timber names (as well as any other species of other animals or plants which may be of interest) I recommend a thorough 'browsing' of the CITES website – though it's not very easy, I warn you.

Of course, the CITES 'list' is always being revised and updated; so if anyone wishes to specify, buy or sell a particular timber at any time in the future, and there is any sort of question about its status, then it is a very good idea to look it up on the CITES website before going too much further.

To finish up this chapter, here are a few quick words of advice on looking for something – such as a timber species – on the CITES website, in order to 'prove' (or otherwise) that it may legitimately be used. Although the 'Search' facility on the CITES site allows someone to enter (type in) a timber by its 'common name', it is not always guaranteed that it will be found by that process and so an enquirer may be fooled into

(Adapted from information on the CITES Website)

There are THREE so-called 'CITES Lists' - but in reality they are 'Appendices' which relate to the restrictions on trading in threatened or endangered species.

Appendix I

This includes all species threatened with extinction which are or may be affected by trade. Trade in specimens of these species must be subject to particularly strict regulation in order not to endanger further their survival and must only be authorized in exceptional circumstances.

Appendix II

This includes:

- i) all species which although not necessarily now threatened with extinction may become so unless trade in specimens of these species is subject to strict regulation in order to avoid utilization incompatible with their survival; and
- ii) other species which must be subject to regulation in order that trade in specimens of certain species referred to in subparagraph i) above may be brought under effective control [e.g. species that are similar in appearance to those included in Appendix II].

Appendix III

This includes all species which any Party identifies as being subject to regulation within its jurisdiction for the purpose of preventing or restricting exploitation, and as needing the cooperation of other Parties in the control of trade.

FOR MORE DETAILED INFORMATION VISIT THE CITES WEBSITE

Figure 4.3 The three different CITES appendices.

thinking that their choice of a particular timber is therefore 'safe' and available for unlimited trading and use. But that may not be the correct answer, and that may lead to future difficulties. It is a much better idea to ascertain the timber's full, official 'scientific name' (using both its genus and its species name too, if possible) and then to enter that information into the site's 'Search' box. By doing that, this more detailed information will definitely locate a particular timber – if it is indeed present – in any of the three CITES appendices where it may be lurking; whereas simply using the 'common name' of the timber may not find it.

So much for all the rules and regulations controlling the specification and use of timbers in a sustainable and/or legal way, Now I want to help you as specifiers and users, by having a look at how anyone could, and should, go about properly specifying a 'sustainable' timber for a particular project. And

Table 4.1 Timber species on the different CITES appendices (lists) as at 2013.

CITES Appendix	Scientific name	Common and trade names	Distribution
I	<i>Abies guatemalensis</i>	Guatemalan fir	C America
	<i>Araucaria araucana</i>	Monkey puzzle	S America
	<i>Dalbergia nigra</i>	Brazilian rosewood; Rio rosewood; Bahia rosewood	Brazil
	<i>Fitzroya cupressoides</i>	Alerce; Patagonian cypress	S America
	<i>Pilgerodendron uviferum</i>	Pilgerodendron	S America
II	<i>Podocarpus parlatorei</i>	Parlatore's podocarp	S America
	<i>Aniba rosaeodora</i>	Brazilian rosewood; Pau rosa	S America
	<i>Bulnesia sarmientoi</i>	Argentine 'lignum vitae'	S America
	<i>Caesalpinia echinata</i>	Pernambuco; Brazilwood	Brazil
	<i>Caryocar costaricense</i>	Aji	C & S America
	<i>Gonystylus spp.</i>	Ramin	SE Asia
	<i>Guaiaicum spp.</i>	Lignum vitae	C & S America, Caribbean
	<i>Oreomunnea pterocarpa</i>	Gavilan	C America
	<i>Pericopsis elata</i>	Afromosia	W Africa
	<i>Platymiscium pleiostachyum</i>	Cachimbo; Granadillo	C America
	<i>Pterocarpus santalinus</i>	Red sandalwood; Red sanders	India, Sri Lanka
	<i>Swietenia humilis</i>	Honduras mahogany	C America
	<i>Swietenia macrophylla</i>	American mahogany; Big leaf mahogany; Brazilian mahogany; Honduras mahogany	C & S America
	<i>Swietenia mahagoni</i>	American mahogany; Cuban mahogany; West Indian mahogany	Caribbean, C America
III	<i>Cedrela fissilis</i>	Argentine cedar	S America
	<i>Cedrela lilloi</i>	Cedro	S America
	<i>Cedrela odorata</i>	Spanish cedar, Mexican cedar, Cigar-box cedar	Caribbean, C & S America
	<i>Dalbergia retusa</i>	Cocobolo	C America
	<i>Dalbergia stevensonii</i>	Honduras rosewood	C America
	<i>Diospyros spp.</i>	Ebony	African populations
	<i>Dipteryx panamensis</i>	Almendro	C America
	<i>Pinus koraiensis</i>	Korean pine	E Russia, Korea, Japan
	<i>Podocarpus neriifolius</i>	Podocarp	SE Asia
	<i>Tetracentron sinense</i>	Tetracentron	China, Nepal

then how the supply chain details of that timber can be checked out, all the way down the line.

So, I would advise you to think of the next chapter as a sort of 'practical exercise' in understanding and using everything that I've written about so far.

5

Specifying Sustainable Timber for Any Project: Some Important Dos and Don'ts; With a Bit More About Wood

As I said at the close of the last chapter, you ought to think of this one as a sort of 'practical exercise' in applying all of the stuff that I have covered up to this point in the book. Really, there isn't a great deal more to say, at least in respect of the specific things you need to know about, and which questions you need to ask, in order to be sure that you go about things in the right way, as you prepare your own 'sustainable' timber specification, or fulfil a timber supply order requiring 'sustainable' timber to satisfy it. But I will add a little more detail, or some notes of clarification, to some of the topics I have touched upon already.

It is also my intention to include here some more (not too complicated) information about the essential properties of wood as a material, because I want everyone to use timber and wood-based products properly in *all* respects – and not to use wood just because of its 'green' credentials. After all – it's no good specifying and using a sustainable timber that then rots away, because you didn't consider its overall working properties in relation to its situation of use.

You will also find in this book a couple of informative chapters on the different types of timber that are most regularly available in the UK; and these will follow on immediately after this chapter. In those later ones, I will be telling you about the timbers' specific properties and I will show you that a surprising number of timbers – both softwoods and hardwoods – have a very good 'sustainability pedigree' in their own right. But now, on with the matter in hand.

5.1 Using wood in a sustainable way

The process that I am about to describe is not necessarily the *only* way that someone could go about ensuring that they specify, order or use wood in a 'correct' legal and sustainable way, but I hope that it will at least be a fairly logical way of ensuring that any timber specification does what is required of it. And I intend that this present chapter will make it clear what will, and what will not, be acceptable for any particular job, so far as the timber is concerned. I will be bringing out the most important elements that I think you need to consider, but I will not of course be repeating everything; so please go back and look up anything you may be not quite clear about, in the previous chapters.

Of course, this entire book is predicated very much on the *sustainability* of timber usage, and, whilst that is a most laudable aim – and it is something that everyone should be striving for – it is still very much a *voluntary* process at present (unless you are working for the UK government). So for a start, one of the most important things to do, in respect of any timber specification that is being put together from now on (and by which I mean, one which is designed to meet the requirements of the EUTR), is to ensure that what you ask for and use has – at the very least – been obtained *legally*.

I've already given you quite a bit of information on the body known as CPET and their role in helping to establish the sustainability 'credentials' of potential timber supplies. But as well as doing that, they can also be very helpful in co-ordinating and explaining the ins and outs of operating correctly within the UK government's Timber Procurement Policy (the TPP). It is worth knowing that CPET will, on request, provide anyone with a set of model 'sustainable specifications' for over 60 commonly purchased products. And such detailed specifications – both in their principle and in their spirit, if not in their exact 'model wording' – are in fact mandatory for *all* central government departments, who are of course required to meet the TPP in full, without any exceptions.

Moreover, the use of those CPET model specifications – at least in their outline and format – is being actively encouraged for all other public sector bodies (such as the NHS, for example), even where that is not currently a mandatory requirement. And even the private sector is being urged to follow that route

as well, if it wishes to adopt those closely-prescribed ways of being more ‘green’ in its approach to the uses of wood. So that’s a good thing, too.

5.2 The government’s Timber Procurement Policy (TPP): A brief reminder

The TPP, as I have described more fully in the previous chapter, requires that anyone who abides by it (either as may be mandated through a policy directive; or if voluntarily adopted; perhaps through some request or ‘encouragement’ from a major client) must ensure that *all* the timber and wood-derived products used under its auspices must be from independently verifiable legal *and* sustainable sources. A very good way to ensure at least the legality aspects is if the wood supplies come from fully documented and FLEGT-licensed timber, although many FLEGT VPA schemes will also cover a good many aspects of sustainability, too. If there is any doubt about what any scheme actually covers, then CPET can also give a ruling on just how acceptable any particular FLEGT documentation is, and just how far down the ‘TPP’ road it is likely to get you.

5.3 Certificates

Please don’t forget that you should – indeed, you must – ask for copies of any of the supplier’s certificates (genuine ones that is) in order that they can prove the claims they are making about both legality (which is a minimum requirement for forests) and Chain of Custody (which is needed to ‘prove’ that the timber supplies are still what they claim to be). But beware: it is very much the case – at least, so far as CPET are currently reporting – that some of the documentation which is ‘floating around’ out there, and which purports to ‘prove’ compliance with some particular Chain of Custody or FLEGT scheme, is not always all that it is cracked up to be. So, whenever you specify or order C-o-C timber, for example, and you are shown (or more likely nowadays, are emailed a PDF of) some apparently ‘genuine’ copies of what appear to be the appropriate documents, then just stop for a bit and ask your supplier a few basic questions about the validity of the supply chain of the timber concerned.

5.3.1 **Checking up on the C-o-C**

The actual process of checking up on someone's genuine C-o-C paperwork couldn't really be more straightforward. All you need to do is to simply look up their 'C-o-C licence number' on the relevant certifier's website (this must be quoted on their documents – and also probably on the timber packaging, or even on the products themselves – see the photograph in the last chapter). If it should happen that no C-o-C number is quoted by them at all, anywhere, then that should definitely set your alarm bells ringing very loudly.

The C-o-C number will usually be one relating to the PEFC or the FSC, as far as the UK is concerned, since as I have said, only those two are now dealt with in a UK context and all other schemes come under the 'umbrella' of the PEFC. And then, when you have the relevant C-o-C number to hand, all you need to do is use the 'Search' facility on the relevant certifier's website to check and see if that certificate is listed: and – more importantly – if it is still current.

If you can't find any trace of the quoted certificate, nor any record of the particular trading company's C-o-C licence number (which is required to appear on all shipping documents and pack labels, so that you can easily find it and refer to it); or if instead, the licence number which you have been given is stated on the certifier's website as being suspended or withdrawn, then that is the time to start asking serious questions of the supplier who gave you that information. Because *all* Chain of Custody Certificates and licences that are currently valid will be listed on the certifier's website: and so anyone who is claiming validity, but who is actually not so – for whatever reason – cannot appear on the list of current licensees. It really is as simple as that, to check whether someone is trying to pull the wool over your eyes and in this particular sphere of business, at this particular time – with the EUTR and all that – such dishonesty is not to be tolerated; and it is your job to help uncover any such fraudulent behaviour. Otherwise, your own due diligence isn't working properly, either.

5.3.2 **'Broken chain'**

The next-worst thing to having an invalid or out-of-date C-o-C Certificate or licence – and thus claiming to be supplying 'sustainable' timber when it cannot be proven to be so – is to be selling *someone else's* C-o-C timber and claiming it as your own.

In other words, the timber may have had a perfectly valid set of C-o-C documents at some point in its life; perhaps right up until a certain 'link' in the supply chain was reached, but then that link has been broken – either deliberately, or through ignorance of the process – by the person or company responsible for finally supplying the timber to you. It sounds unlikely, perhaps; but such 'broken chain' incidents are far more common than many people realise.

The most usual example of a broken chain is where a timber merchant keeps stocks of (typically) PEFC- or FSC- 'badged' timber and then anyone visiting their yard can see for themselves that those packs of timber do indeed have C-o-C stamps on the wrappings or labels; or maybe even the spray-painted logo of a well-known certifier on them. But that – Dear Reader – is, of itself, just not good enough. I have come across dozens of examples of timber or builders merchants – and even the odd local sawmill – where the seller has claimed, in more or less these words: 'All our timber stocks are FSC certified'; or 'We sell Chain of Custody Certified Timber'; or some variation on that theme. But, when one looks more closely; or asks the direct question: 'Can I see your Chain of Custody licence', it transpires that the merchant in question has no such thing. They are in fact selling their 'Chain of Custody' timber on appearance only – without the necessary Licence – and therefore of course without any valid Chain of Custody to the timber at all.

'But why does that final link matter?' you might say. 'Hasn't the timber been fully Chain of Custody Certified already?' Well: yes and no. Maybe, and maybe not. For one thing, not having the appropriate licence is, in effect, 'cheating' – and so it is unfair on those who have gone to the trouble and expense of doing it properly, but there is a more serious issue at stake, too. Ignorance of the need for a continuous and unbroken 'chain' may be one thing, but the real need for a C-o-C licence to be present all the way down that chain, is so that the final purchaser and user can be absolutely certain that there has been no dishonesty or 'substitution' of valid timber by any illegally obtained or 'unproven' wood.

After all, who is to say that the packs of timber which are presently wrapped in (say) FSC-badged packaging are in fact the same ones that were originally bought as 'proper' C-o-C material in the first place? Wrappings can be re-used, after all and the FSC or PEFC logo is quite easy to copy, if someone

should wish to be unscrupulous. But even supposing that there is no deliberate deceit intended; it is still perfectly possible for packs, or individual pieces, of *un*-certified timber to be mixed up with 'proper' certified timber in a yard, especially where those packs have now been opened, and the customer perhaps only requires a few tens of pieces and not the entire pack-load.

The whole point of requiring Chain of Custody licensing *all the way down the chain* is so that there is a proper, organised and documented *system* which is then being followed, so as to ensure that no 'mixing' of certified and uncertified material can happen: accidentally or otherwise. And making sure that everyone in that 'chain' is properly licensed – and therefore has a well-organised system of separating their certified and uncertified stocks – is surely the correct thing to be doing, for all concerned.

So – Mr Specifier, Mr Builder, Mr Timber User – it is as much *your* responsibility as it is anyone else's, to ensure that the 'chain' in the 'Chain of Custody' remains unbroken; and to refuse to buy so-called 'certified' timber from any source – *any source whatever* – that cannot show you proper evidence of *their own* C-o-C paperwork: and *not* somebody else's.

5.4 What if I can't get the timber I want?

It is a fact that, in 99.9% of 'normal circumstances', the requirements for full proof of sustainability must be strictly adhered to: but the Timber Procurement Policy does allow for the very rare possibility – albeit in some highly exceptional circumstances – of using timber from a currently non-sustainable (and very likely therefore, not fully documented) forest source. Such an occasion will generally be where a particular species of timber, or wood-derived product, that may be made from a non-documented source, is genuinely *needed* for a specific job; and it so happens that no other fully-certified (or even FLEGT-verified) source of that exact species is currently available.

However, it's not *that* straightforward. You can't just say 'I need this exact wood', no matter what restrictions may be in place, and just expect that you will be allowed to use it and not then be in breach of the TPP. In all such cases, CPET will require you to have some form of proper justification as to why that particular species *must* be used; and why no other alternative will do for the job in question. And any such 'justification' by the party wishing to use a non-certified



Figure 5.1 Short-rotation coppice – this may be excluded from the requirements of the EUTR (picture from Wiki Commons).

timber must be given in the form of a written statement, laying out the case for its use.

So you can see that – even before the advent of the EUTR in March 2013 – CPET already had some pretty tough rules in place to ensure that any ‘timber exception’ still had to be as least *legally* obtained, as the minimum requirement. And there also had to be very good and robust evidence to support any statements being made about the claimed ‘legality’ of those supplies. It is of course entirely possible that, even after all of the above, CPET could still rule against you and say that the use of your ‘must have’ timber does not sufficiently meet the TPP criteria for them to allow you to use it. And they can request (or rather *insist*) that you find an alternative timber species.

The only legitimate exemption to the very strict terms of the TPP – at least, in respect of newly harvested timber – is something known as ‘short rotation coppice’. This is exempted because it comes under agricultural regulations, rather than under the government’s rules on forestry. (As to what exactly *is* ‘short rotation coppice’, you will need to check with CPET, if the situation ever arises where you contemplate using such stuff. But it is my understanding, from talking to them, that a three-year crop rotation cycle is considered to be ‘short’: and so

anything grown for any other sort of ‘quick harvest’ – for use as biomass, for example – may still fall under the TPP if it is cropped at any interval greater than three years.)

5.5 The use of recycled timber

Another interesting exemption from the TPP is recycled timber, as I mentioned very briefly in the last chapter. Recycled timber is known, in the fascinating jargon of government-speak as given in the TPP itself, as: ‘Wood which has had some previous use’. But CPET’s own, rather more long-winded, definition of what exactly constitutes recycled timber is this: ‘Wood or wood fibre from pre-consumer industrial by-products; post-consumer recycled wood and driftwood’. (That last word is a very interesting one, perhaps you should go out and scour the sea-shores when you next have a timber project!)

And CPET’s wider definition of ‘recycled timber’ also includes any wood (be it ‘reclaimed’ or otherwise) that was originally harvested more than 10 years prior to its present use. That may be because the trees had not been sold at the time, or it may be because someone has stock-piled a lot of the timber against a future need. (This happened in the 1970s when Dutch elm disease killed most of our native English elm trees; and one of the more well-known furniture manufacturers bought up huge stocks of the timber before it had time



Figure 5.2 A heap of ‘waste’ wood awaiting recycling (picture from Wiki Commons).

to rot away in the woods and fields. But that was in ‘pre-CPET’ times, of course.)

However, to make a strong case for being allowed to use any such ‘pre-harvested’ wood, some reasonably good proof of its ‘felling age’ will be required; since there is an obvious risk that some people may try to fake the evidence of a previous felling and/or storage history. (Also bear in mind what I said in the last chapter about the CITES listing of ‘prohibited’ timbers. Any claims about a timber species which is prohibited, according to the CITES I Appendix, will still be highly likely to be thoroughly investigated, if that wood species is even so much as suspected of being on the CITES I list, however long ago it may have been harvested, or first used.)

But overall, the message here is quite clear: if your project can be designed so as to be able to use some ‘proven’ recycled timber – of whatever form – then you needn’t worry about meeting all of the other ‘legal and sustainable’ criteria that you would otherwise have to, if you had wanted to be allowed to use ‘brand new’ timber from any other source. In that latter case, you will still have to jump through all of the CPET hoops, I’m afraid: and then it’s hardly a walk in the park (if you’ll pardon my mixed metaphors).

5.6 Insisting on a particular Chain of Custody ‘brand’ for your certified timber

There seems to be a very common habit amongst those who issue orders for ‘sustainable timber’ of specifying the particular ‘brand name’ of FSC – and FSC *only* – as *the* valid proof of the correct sustainability credentials, for the wood being supplied and used. But this approach is not only a misunderstanding of the rules, it is actually *wrong* – as I hinted at, in an earlier chapter.

CPET makes it very clear that any specification which seeks to meet the TPP *must* avoid any reference to just the FSC on its own. Nor should anyone ask for ‘PEFC certified’ wood by that name alone either: it would not be permitted. But that latter situation rarely arises. FSC is so frequently mentioned on its own, because its ‘brand’ has such a high profile, as I have already said.

I have told you that there are quite a few other ‘sustainability’ certification schemes around the world; and all of those others, except for the FSC scheme, are dealt with in the UK under the

larger umbrella of the PEFC (which, to remind you, means the 'Programme for the Endorsement of Forest Certification schemes' – and thus its role is precisely that: to *endorse* the Forest Products Certification Schemes of others).

On the question of just what you are actually allowed to ask for, as proof of Chain of Custody, the actual CPET/UK government rule is that any specifier who requests such proof *must* ask for it in that exact way. It must be referred to only as 'Chain of Custody Certified Timber' and any such specification must *not* insist on using either FSC or PEFC timber, or indeed timber covered by any other C-o-C scheme, by name. That is in order to give the supplier every opportunity to source his timber supplies from certified sources without unnecessary restrictions.

It is also worth noting that it was a good ten years ago – back in the early 'noughties' – that the European Parliament passed a resolution which stated that both PEFC and FSC provided equal and valid proof of sustainable timber sourcing to the European Union. So that made it clear there was no 'best' scheme to use.

However, should anyone still not be sure of what they should be asking for, or exactly how to phrase their documentation, then you can always go direct to CPET and use their helpful 'model text' on this very subject: something which they are happy to provide, upon application to them.

I want to make a final point in relation to the ongoing 'battle' between FSC and PEFC to gain recognition and credibility in the eyes of the public. There is still a lot of 'mythology' (or nonsense, as I might call it) doing the rounds, as to which one is the 'best'. And yet it is worth repeating the little-known fact that the PEFC currently has about *twice as much* of the world's forest area under Chain of Custody Certification than the FSC does. Which goes to show that having a high profile name, created more or less entirely through advertising and publicity stunts, doesn't necessarily mean that their 'opposition' is in any way inferior or insignificant.

Having now put you firmly on the right track, with respect to which route you should be going down in order to create a properly legal and 'environmentally sound' specification, I now want to help you through the tricky business of choosing the right wood (or wood-based material) for the job. It is so easy to get bogged down in the 'legality and sustainability' rules and regulations that you could then – a bit unfortunately from my point of view – forget all about the *technical* aspects of

what it is you want the timber or wood products to actually *do*. Just because the supply chain of a particular wood species may be ‘certified’ as being in some way ‘green’, doesn’t at all mean that the particular timber you’ve chosen is also naturally the ‘best’ wood species to do the job.

5.7 Deciding which wood to use

Of course, the ideal thing to do would be to read my first book: *Wood in Construction – How to Avoid Costly Mistakes*. But failing that (or if you can’t now find it on your bookshelf), I am going to outline the main things that you need to consider – without going into any huge technical details behind what I am about to say. (For the properly detailed explanations, and to get a better understanding of what lies behind my recommendations, you really *do* need to read that other book!) As I say in there – and also on the numerous occasions when I lecture on timber: ‘There’s no such thing as wood!’

Which is to say that there is no one universal material called ‘wood’ which will do absolutely everything you demand of it. There are different species, each with differing properties, some of which are more suitable for some jobs than others. And you need to understand that, if you wish to use wood successfully and minimise problems when it comes to ‘snagging’ time in your new building (or whatever else it is that you have done with that timber or wood-based product).

Anyway, here’s what I think you should know, in addition to the question of whether you are OK to use that timber, under whichever set of rules you’re trying to obey. But please don’t take this little section as any sort of ‘definitive guide to wood specification’, it is only meant to point out to you the things you need to consider and to take account of, in your design, specification and use. It is a help, but no more than that.

5.7.1 Where it’s used: Indoors or outdoors

The first consideration must be *where* the wood will be used. If it’s going to be indoors, then that creates one particular set of parameters; and if it’s out of doors, then there will be other things to consider. Using timber or wood-based products indoors generally subjects them to fewer difficulties in service than using them where they will be exposed to the elements. But even so, there are things which can go wrong; and the

principal one is moisture content, which I will elaborate on in its own section below. (In my professional life, I have investigated hundreds of cases where the wood had suffered damage or distortion, simply because someone forgot to control its moisture content properly). Using timber or wood-based products out of doors presents more challenges; most of which however can be easily overcome by the correct choice of species, preservative treatment or some other process. As you might expect, moisture content also figures largely in this scenario. But then so does wood preservation – which may or may not be required, depending upon your choice of species. Some timbers (and some wood-based boards which could also be used out of doors) require preservative treatment to a certain level, if they are to withstand higher moisture contents in service, and so avoid problems of decay. But other species have good resistance to decay without the need for any chemical additives (and this is a property of timber known as ‘natural durability’). In certain situations, the choice of such a ‘durable’ wood for an outdoor job may be a very good alternative to any chemical treatment.

5.7.2 *Moisture content*

I have touched on this a little bit, but I thought it best to give it a small sub-section by itself, since it is so very important to understand, in getting the best from any timber or wood-based



Figure 5.3 Wood which has rotted due to a very high moisture content in a susceptible timber species.

product. The key to getting moisture content ‘right’ for any timber in any situation is to know – and then also to remember – that wood is ‘hygroscopic’, which means that it is constantly going to react to moisture or humidity in the surrounding atmosphere and ‘adjust’ itself accordingly. In adjusting its moisture content into what is known as ‘equilibrium’ with its surroundings, the wood will either swell (with any increases in its own moisture content) or shrink (as its own moisture content decreases). And that very specific behaviour of timber – known as ‘movement’ – needs to be taken into account as part of the overall design and material specification.

High moisture content in wood can lead to decay, as I have said (that is, if the wood is not a species that is naturally durable). But even then, the alternative of putting preservatives into timber is not a ‘given’ and it may not be straightforward since different wood species react differently.

5.7.3 *Preservative treatment*

Not every timber needs to have a wood preservative added to it. Wood used indoors, in the dry, does not of course require any form of preservation at all to resist decay (although it may – in very exceptional circumstances – need some form of insect treatment, but that is very rare in most uses in the UK). A timber with a good level of natural durability needs no treatment



Figure 5.4 Wood being pressure-treated with a preservative.

either, as I stated above. Which only leaves those timbers which have low levels of natural durability and which are to be subjected in service to high levels of moisture – either from outdoor exposure of some sort, or from a high humidity environment, such as in a swimming pool.

Now here's the rub: some timbers which have very poor natural durability are also very difficult to treat with wood preservatives – and these are known as 'resistant' species (resistant to treatment, that is, not resistant to decay!). So you will need to choose your wood species wisely, based on a 'balance' of these two fundamental properties – its natural durability and its resistance to treatment – if you hope for it to last a long time in any high moisture, high-risk environment.

5.7.4 Stability

There is another aspect to moisture that I need to consider separately; so I've given it a sub-section of its own. Different timbers will react to changes in moisture content in greater or lesser ways; and so it is possible to minimise 'movement' (as timber's reaction to moisture is known, if you recall) by choosing a wood species which is known to have 'small movement' characteristics – when all else is equal. And that means your timber components will be more 'stable' in service, if the wood itself is less reactive to changes in atmospheric humidity, and thus in its own 'internal' moisture content. (Certain wood-based boards – such as plywood – can be much more moisture stable than solid timber; so consideration may be given to their use in particular situations. But then, manufacturing quality considerations will be paramount if you are relying on the make-up of plywood to help with its stability, and that's another story ... for the other book!)

5.7.5 What it's going to be used for: Structural, joinery, fencing, furniture

The particular end use of any timber is another highly significant factor in deciding which wood species – and, just as importantly, which *quality* of wood – to go for.

For constructional, load-bearing members, the strength grade or strength class of the timber will be the overriding factor. Appearance may well be secondary; especially with things like softwood joists and roof-truss timbers, which



Figure 5.5 Typical 'knotty' quality timber as used in lower-class joinery.

will not be visible in the finished construction. Moisture content and subsequent movement is usually much less critical here too, although it should not be ignored altogether – and there are standards which limit the moisture content of structural timber at the time of installation.

Joinery timbers, by their very use, have quite a significant visual requirement to fulfil. So the right quality specification – clearly stating the appearance requirements – is the key to good performance in that respect. In addition, softwoods used for external joinery will normally need to be given some degree of preservative treatment; whereas internal joinery items will not. But the correct moisture content at the time of specification – whatever the end-use – and also its reasonable control in service, are vital factors in getting the wood to remain stable (also taking into account what I said a little earlier on that topic). Joinery items are seldom load-bearing; and so the wood's strength is not usually a significant factor, but straightness of grain and a relative freedom from knots will help it to 'behave' better, as and when its moisture content fluctuates in service. And of course, it generally needs to 'look' good, which brings in the matter of grading and selection, too.

5.7.6 Finishes

The choice of wood species – and of course the exact end use – can also influence the choice of whatever surface finish is selected for the job (if a surface coating of some sort is to be used at all, that is). Indoor timbers – especially hardwoods – that are to be 'on show' (as opposed to being painted) will often receive a translucent finish; but then the wood's own natural colour-tone will very much affect the final colour of the finished



Figure 5.6 Wood will ‘weather’ naturally out of doors to a silver-grey colour, without any protective decorative finish.

wood. It must also be remembered that exposure to sunlight will usually darken most timbers over time, as well.

Outdoor timbers almost always need to be coated with a specially-formulated ‘exterior wood finish’ which resists trapping any moisture beneath a surface film or ‘skin’ – because that is the very worst thing you can do to wood out of doors. (And please: don’t *ever* use ‘yacht varnish’ on your fence or garden furniture!) An alternative to finishing the wood with an exterior coating is to just leave it to ‘weather’ to a natural, silver-grey finish: and provided it has adequate natural durability, it won’t come to any great harm. However, not everyone is keen on the ‘weathered’ look in the UK, I have to say; even though it is very popular in North America and in many parts of Europe. I should also say here – since I get it reported so often during my site investigations – that

leaving wood to ‘weather’ is *not* a cause of movement or decay problems, by itself. That is merely the excuse which so many manufacturers and installers use to fob off ‘innocent’ clients; so as to avoid any blame coming back on themselves when they have designed, made or installed something which has then gone wrong.

5.8 Some of wood’s other characteristics

This whole section was meant to be just a quick ‘canter’ through the essentials of what sorts of things you should be thinking about when using wood for anything; and I can’t – and nor do I want to, in the context of this particular book – cover every last property of timber, or deal with all the standards to which you need to refer. And yet, it is worth closing this part of the chapter by mentioning at least some of the other things you should bear in mind when composing a ‘good’ specification for wood – or even if you are just making something out of this unique material.

5.8.1 Colour

I touched on the question of wood’s own natural colour when I talked about ‘finishes’; and it is important to realise that no two pieces of wood – even of the same species – will be identical in colour, or in the character of their appearance. In one respect, that’s what is so good about wood: every single piece is different from every other piece, even if only subtly. But that can also present a challenge sometimes; say when matching up longer runs of material for panelling, or for flooring, for example. So you need to be very careful when looking at just a small ‘sample’ of the wood you have chosen – maybe based purely on its environmental credentials – because it may be one of those timbers which shows tremendous variance in the bulk of its supplies and so a sample of just a single piece could be very misleading.

Or perhaps it is a timber that fades or darkens quite drastically on exposure to light; and so you won’t then end up with the colour you expected when it was first installed. Or it may weather more readily; or it may not easily accept the finish that you wish to use. I could give you dozens of examples on

those variations, but I will limit myself to just one – Western red cedar. This softwood is often chosen by architects because it lasts well out of doors, with no need for preservatives; and it has an attractive red-brown colour; although very often it is used without an exterior finish, on account of its initially pleasing colour tones. But both of those things have led to problems, time and time again. The colour of Western red cedar is not always ‘red’ – it can vary quite naturally from pale, salmon-pink to deep, chocolate brown (quite a contrast!) – so the job of matching up adjacent boards on a long run of exterior cladding can be a big challenge, to say the least! And then, after only a year or so of exposure to the elements, the more sheltered areas on the building – in window reveals or under eaves, for example – may still be bright and more or less reddish-looking, whereas the main bulk of the cladding will by then have turned silver-grey; giving a contrast on the face of the clad building that was probably never intended by the original designer.

5.8.2 Texture

This characteristic is another feature of wood which people tend either to overlook or ignore; or are just plain ignorant about. Wood is not plastic – thank goodness! – so it doesn’t have a repetitive or uniform ‘look’ to it. But different uses of different timbers will sometimes need to take into account whether or not it has a ‘coarse’ or a ‘fine’ surface texture. Most furniture woods will have a fine or medium texture, so that they can be prepared to a very smooth finish and then coated in a lacquer or varnish and then leave a high sheen. But some woods are not good at doing that, and they either absorb too much finish into their large, coarse pores, or they give an uneven look to a highly-polished surface. Some particular – and generally speaking, coarser – textures can also cause problems with timbers when being used out of doors. There is a greater tendency for them to crack and break up within their surfaces, much more so than ones with a finer texture would do, and this can both affect their appearance, and also shorten the life of any exterior finishes applied to them.

Those last few comments now bring me on neatly to the next couple of chapters – where I will be listing and commenting on a whole range of timbers that are available for joinery or construction projects, within a UK context. And I am going to be referring to things like natural durability and texture as part

of that. Therefore, as well as knowing that the supplies of the timber you hope to be using are legal and sustainable (which I will also be telling you about of course) you will then also be able to ensure that your chosen timber has all – or at least, most of – the characteristics that you need it to have, for your intended end-use. And then, if you take all of those relevant properties into account when you write your specification or recommend that timber to a customer, you will be letting the wood do its desired job, as well as it possibly can.

6

Some Principal Softwoods Used in Construction in the UK: With Their Main Properties and Sustainability Credentials

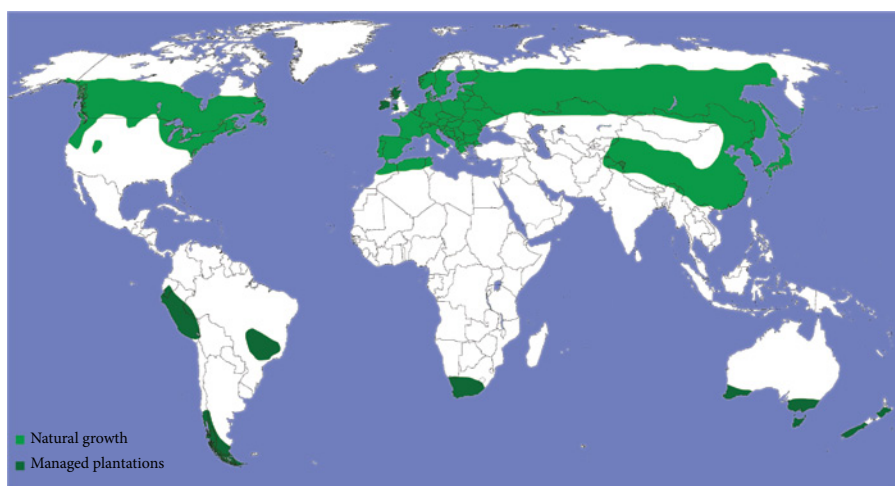


Figure 6.1 Approximate distribution of the world's softwood forests.

This is the first chapter of two that are dedicated entirely to different types of timber; and they are intended to help you with the specification process. These two chapters are designed to help you to choose a timber that not only suits your 'environmental' requirements; but one which will have a range of properties or characteristics that will enable you (and the wood of course!) to do the job right, in every respect.

I am starting off with the softwoods: which tend very much to be the 'workhorses' of the wood industry. They are used

for most normal construction: roofs, loadbearing and non-loadbearing framing, less expensive joinery, flooring (sometimes), interior panelling and exterior cladding, domestic decking, fencing and other outdoor 'landscape' uses.

My approach will be to describe the timber's general appearance, give some idea of its average density, and then itemise its main characteristics. And these properties of any wood – which can vary quite a lot from one species to another – are of course the things you need to take account of, when considering specifying that timber for a particular job. Then I will finish off the description of each softwood type with a view on the latest information regarding its availability as either – or both – legally and/or sustainably harvested timber for use in the UK.

As I did with the timber descriptions in my other wood book, I will begin this 'dedicated' chapter on softwoods by outlining the UK's two most commonly-used – and also the most commonly available – softwoods types. These are known almost universally within the UK timber trade by their common names of 'European redwood' and 'European whitewood' (though most of the timber trade refer to these timbers simply as either 'redwood' or 'whitewood'). That may possibly be as an abbreviation; but more likely it is through ignorance of their full, designated names) After I have covered those two 'big ones' in some depth, I will then cover a handful of some other softwood species that see occasional uses here in the UK.

6.1.1 European redwood (*Pinus sylvestris*)

This, as you might be able to tell from its scientific name, is a true pine. And as I have just said, it is one of the two most commonly used softwoods in the UK; as it has been for several hundred years.

It comes in a huge range of different qualities: from very close-textured and almost knot-free (or with only very small knots), to relatively open textured, with very large knots and other defects, such as wane and resin pockets. This tremendous variability in quality is only partly due to the way it is produced and selected; it is much more to do with where the trees grow.

Pinus sylvestris naturally grows over a huge area, from just south of the Arctic Circle, in Norway, Sweden, Finland, Russia (and also most of the former Soviet Union countries), the Baltic States, and also right through Central Europe, from Poland down to the Alps – and even into Spain and Italy. Although most

of the various qualities that I described above, can be imported from very many different northern countries, as far as the UK market is concerned, the main supplying countries are primarily Sweden and Finland, with some supplies from Russia and very occasional imports (usually of the much lower qualities) from Poland and Latvia.

Like all true pines, the sapwood of European redwood is pale and creamy-coloured, whilst its heartwood has a more or less pinkish-brown tinge to it (and it's this reddish heartwood colour that gives the wood its common name). The wood tends to darken on exposure to UV light; so that after a period of several months, it can take on quite a pleasing, golden colour to the sapwood; whilst the heartwood darkens down to a much more rich red-brown.

The heartwood of European redwood is classed as slightly durable (although some recent Scandinavian research would have it re-classified as moderately durable); and that means it has to be treated with a preservative in order to be used in exterior situations. Fortunately though, it is rated as being easy to treat by pressure impregnation; and its sapwood can be fully impregnated by the high pressure process – giving it a long life in ground contact (up to 60 years, if done properly).

Trees from the more northerly, colder latitudes (Northern Scandinavia or Russia) are of much slower growth; and they produce timber of a much finer and harder texture than wood of the same species grown elsewhere, such as Central or Southern Europe.

The average density of air-dried European redwood is about 500–520 kg/m³, although this will vary considerably, depending upon its actual region and speed of growth. Its movement characteristics are rated as 'medium' – which means that it is neither particularly stable nor particularly unstable, when undergoing changes of humidity and thus internal moisture content.

When it is grown in the UK, this exact same species is officially referred to as 'Scots pine'. It is one of our very few 'native' conifers, which is to say that it was not introduced to the UK from other parts of the world and then planted here deliberately by foresters – although it is now being quite extensively re-planted on a commercial basis. It is therefore the only *native* species of softwood from the UK that is used in any great commercial quantities.

The overall quality of British-grown Scots pine is not generally as good as that of imported pine and it is also not quite as

strong a timber, in its natural state, as the imported variety. Therefore, the everyday trade name of 'redwood' is more correctly reserved *only* for imported timber from Europe, Scandinavia, Russia and the Baltic States. Commercial supplies of *Pinus sylvestris* from the UK should always be referred to as 'Scots pine' – or more simply as just 'British pine'.

In terms of its sustainability, European redwood (the imported stuff, that is) is routinely available as FSC and PEFC material from Sweden and Finland – and with a very high degree of freedom from corruption; if you recall what I said about their CPI ratings – and it is available as FSC material from selected mills in Russia. German and Austrian production is all PEFC-badged; but that is largely academic, since we don't import much redwood, if any, from those two countries.

6.1.2 European whitewood (principally *Picea abies*)

This is the other main softwood that is most commonly used in the UK and especially for structural and constructional uses. The trade name disguises the fact that it is actually not a single wood species, but a combination of two (unrelated) European tree species that are sold under a single commercial description. These two different species are European spruce (*Picea abies*) and silver fir (*Abies alba*).

In the same way as with European redwood, European whitewood is available in a very wide range of qualities, each of which has its preferred (or limited by quality) end uses. In the UK, we tend to use whitewood only in its lower qualities for construction, for some reason; whereas on the Continent, it is the favoured timber for joinery and cladding.

Picea abies grows throughout the same geographical areas as *Pinus sylvestris*, whereas *Abies alba* is restricted more to Central Europe and the Alps. Therefore, commercial parcels of European whitewood from Scandinavia and the Baltic States will be pretty well 100 per cent spruce; whereas the European whitewood we get from countries such as Germany, Austria and the Czech Republic will contain a moderate percentage of true fir. In Switzerland especially, fir trees grow to a very good diameter and so the timber is then processed and sold separately on its own and not as part of a general whitewood specification.

In appearance, European whitewood is bright and whitish, or pale yellowish, in colour; usually with no distinction

between its pale heartwood and its pale sapwood (although sometimes the heartwood of spruce may have a very slight pale brown tinge to it). The pale colour of the wood is, of course, what gives the timber its common name, of 'whitewood'. Unlike pine, even when exposed to UV light, it does not darken very much and so it retains its lighter colouration for a considerable time.

The density of European whitewood is slightly lower on average than European redwood, being about 470–500 kg/m³, when seasoned (air dried). It is also rated as 'medium' movement in response to moisture.

Again, just as with European redwood, the spruce trees that grow in colder Northern latitudes produce a very much finer-textured and better quality of European whitewood, whereas trees that grow in milder climates produce more open-textured and lower-quality timber. However, Alpine whitewood from Southern Germany and Austria is also of a very good, close texture and this is because it grows in the mountains, where, in terms of climate, altitude compensates for latitude.

The heartwood of spruce is generally reckoned to be of very poor natural durability; and so it needs to be treated with preservative for any long-term exterior use. Thus it is not really suitable for very long exposure to ground contact, since – rather unfortunately – it is also rated as being extremely resistant to preservative treatment; which means it cannot take in enough preservative to give it long-term protection from decay.

European spruce, as a tree species, is not native to this country; and so when grown in the UK, it is more correctly known as Norway spruce – or simply as 'British spruce' (although it must be said that the particular species, *Picea abies*, makes up only a small part of all of the so-called 'British spruce' that is grown and harvested in the UK).

In the same way as with the relative qualities of Scots pine versus imported redwood, you will find that British-grown spruce is very much faster grown – and thus of poorer overall quality – than imported European whitewood. It is also not as inherently strong as imported timber of the same wood species and this fact is most important when using it as strength graded timber.

Before describing its availability in any certified form, I just need to add a bit of information on the other spruce species that you will find as part of 'British spruce'.

6.1.3 *Sitka spruce (Picea sitchensis)*

This is another true species of spruce; and the tree is actually a native of North America. However, it is also one of the most commonly-planted timber species in the UK, forming by far the main component of British spruce. Unfortunately, its somewhat lower density and lower bending strength make it less suitable for the higher-strength construction uses, than either imported redwood or whitewood – or even British grown Scots pine.

Because Sitka spruce is, of course, a true spruce, its heartwood is also of very low natural durability, and furthermore, being a true spruce, it is also very resistant to preservative treatment.

As a timber, Sitka spruce is very similar in appearance to European whitewood, and because it, too, is an introduced species, and also because it is grown in large plantations; these two factors mean that British-grown material is generally much coarser in texture, with larger and more numerous knots. It is also – like Norway spruce – weaker than its imported equivalent. However, on the bright side, its movement characteristics are rated as small – so it can be much more stable in service (provided the quality is good; and things like knots and distortions of grain do not upset its shape in other ways).

In terms of the ‘sustainability’ credentials of both European whitewood and British spruce, they are much the same as for European redwood. Most Scandinavian material is either FSC or PEFC badged, depending upon its country of origin (Finland is all PEFC, whereas Sweden has both PEFC and FSC material for export); and all of the German and Austrian ‘Chain of Custody’ Certified whitewood is PEFC badged.

British spruce (both the ‘Norway’ and the ‘Sitka’ sources) is all FSC-badged by the Forestry Commission, under something called the UK Woodland Assurance Scheme (or ‘UKWAS’ for short). This is a unique situation, because *both* the FSC and the PEFC have agreed to co-operate in UKWAS, so as to have only one ‘sustainability’ badge on the timber’s packaging. (So why can’t they do that elsewhere in the world, one wonders?)

6.1.4 *Western hemlock (Tsuga heterophylla)*

This timber is not at all related to either the true pines or the spruces (as you may be able to tell from its very different scientific name), although it does quite have a superficial

resemblance to spruce, or perhaps more so to one of the true firs. (In Canada, Western hemlock and some true firs are frequently sold together as a species group and often exported as 'Hem-fir'; particularly in construction grades.)

Western hemlock comes to the UK principally from Western Canada. The trees grow to extremely large diameters (1.8–2.4m) and also to very great heights (60m or so). Therefore the imported timber is available in long lengths and in large sizes, as well as in 'clear' (knot-free) grades; all because of the very great size of the tree. It also grows all the way down the West Coast of the USA into California, and eastwards as far as the western side of the Cascade Mountains; but we don't tend to import that timber from the USA.

Commonly referred to in the UK simply as 'hemlock', it is a pale, creamy-white timber, sometimes showing a pinkish or purplish sheen; and occasionally showing narrow, dark lines running along the line of the grain. It is generally very slow-grown, which gives the timber a good density – around 490 kg/m^3 – and a pretty good surface hardness (for a softwood, that is); making it ideal for high-class joinery and turned components, such as newel posts for stairs. (This last item is, at the present time, one of the few – and thus most likely – components in which to find hemlock in use in the UK.)

In most other respects – such as its overall working properties, its ability to be treated with preservatives, and so on – hemlock is pretty similar to European whitewood. It also shows no great contrast between its pale brown heartwood and its whitish sapwood, indicating that it is of relatively low natural durability: in fact, it is rated only as being slightly durable. It has a 'small' movement rating; which once again makes it very suitable for joinery.

Although hemlock has been planted to a small extent in the UK, it plays no significant part in the harvested volume of British-grown softwood production.

Western hemlock is available as fully Chain of Custody certified timber, via the Canadian CSA Scheme; but as I have said, such material will bear the PEFC logo on any of it that is brought into the UK. (It is also my understanding that more recently – in spite of the Canadians having their own CSA scheme – some of their forest reserves are under FSC certification, perhaps as a response to demand for a more 'internationally recognised brand'.)

6.1.5 'Douglas fir' (*Pseudotsuga menziesii*)

This tree is a native of western North America, growing in pretty much the same areas as Western hemlock; and being most abundant in British Columbia, Washington and Oregon. (In fact, its two main historical production and supply areas are reflected in two of its 'alternative' and somewhat old-fashioned trading names: 'Columbian pine' and 'Oregon pine'.) Douglas fir has also been planted to quite an extent in the UK's forests, especially in Scotland.

True to the timber trade's habit of not bothering about scientific accuracy, this timber is *not*, in spite of its common name, a true fir (and nor, despite those two old-fashioned names that I just quoted above, is it anything to do with pine either!). And that is why its name, when being used in any standards or technical references, is always written 'in inverted commas' – to show that it is not a *true* representative of the wood type that is used for its trade name. But, as you should know by now, many common names are liable to be misleading; especially if the timber trade has anything to do with it.

Douglas fir, as is the case with hemlock, is a very large tree indeed; producing timber in good, long lengths and large sizes, as well as being available in 'clear' (knot-free) grades. Even the British-grown material is available in respectably large sizes; but – as you might by now expect to be the case – the timber grown in this country is not quite as good, in terms of either visual quality or strength, as that imported from the North American continent.

The density of Douglas fir is typically around 530 kg/m³ – which is a bit higher than European redwood and hence its reputation for slightly better strength. (It is at least as strong as European redwood or whitewood, although Canadian sources frequently claim that it is stronger than most other softwoods.)

The timber itself has a very distinctive character, having a deep orange-red heartwood and also a very marked contrast between the earlywood and latewood (darker and lighter) parts of the growth ring; thus giving rise to a very pronounced 'flame' figure, as it is known, in plain or flat-sawn material and a strong parallel 'stripe' figure when it is quarter-sawn. (The North Americans, quite wrongly of course, call this stripe 'comb grain', but this figure is caused by the pattern of the growth rings, and *not* by the orientation of the grain). The sapwood of Douglas fir, by contrast, is pale and creamy-coloured,

although commercial parcels of Douglas fir are unlikely to feature much sapwood in them, since that is usually trimmed off at the sawmill, on account of the very large size of the tree; and thus there will be only a relatively tiny proportion of sapwood in any of the sawn boards, compared with the much greater volume of heartwood thus produced.

The heartwood of Douglas fir is rated as moderately durable – which means that it can be used for such things as cladding or external joinery, without needing any additional preservative treatment; and in fact, it is classed as being resistant to treatment with preservatives, although by using an extra process (which I won't go into here), it can be successfully pressure-treated to levels of retention which will enhance its natural durability well enough to enable it to be used satisfactorily in more or less any fully outdoor or ground-contact situations. It has 'medium' movement characteristics; so its stability in service will be similar to European redwood.

With regard to its availability as Chain of Custody certified timber; the story is exactly the same as for Western hemlock. CSA-certified material is available domestically – in Canada, that is – and if certification is required in the UK, then it can be PEFC-badged. British-grown Douglas fir will, of course, come under the UKWAS 'umbrella' and will thus bear the FSC logo when fully certified.

6.1.6 Larch (mainly *Larix decidua* and *L. kaempferi*/ *L. leptolepis*)

Larch, most unusually amongst the conifers (which of course, is what softwoods actually are), is *deciduous* – that is to say it loses all its needles in winter.

As a tree it is not native to the UK, although it has been planted fairly extensively here, but in its natural growth, European larch (which the first-named of the 'scientific' names above) is very widely spread throughout all of mainland Europe. Japanese larch (which is the second 'pairing' of scientific names quoted above; and which are alternatives) has also been planted in Britain, especially in Scotland and Wales.

All of those different species of larch are really quite similar in appearance, and in fact, they also strongly resemble Douglas fir, in both colour and overall character; having a very prominent growth ring figure, with a pinkish heartwood surrounded by a narrow band of creamy-coloured sapwood.

The average density of larch grown in the UK is about 530–590 kg/m³, which gives it a very good structural strength. In fact, its strength is also quite high – very similar to Douglas fir – as is its natural durability; with its heartwood being rated as moderately durable. It is also classified as a ‘medium’ movement timber.

In the UK, commercial larch is not usually grown to as large a diameter as Douglas fir; and so it is not often used for any significant construction uses. It also tends to be very knotty, and it is often prone to numerous black, dead knots, which therefore tends limit its uses to packaging, fencing and, in slightly more highly-selected qualities, exterior cladding – where it may be used without preservative treatment.

All British-grown varieties of larch can be included in the UKWAS Certification Scheme (with the FSC logo), if full certification is required for any particular use. European supplies of larch are available with FSC certification, as well.

There is another species of larch (*Larix occidentalis*) – known as Western larch – which grows naturally in British Columbia, Canada, and it can sometimes be found in the UK; where it would then usually be included as part of a shipment of the species group ‘Douglas fir-larch’. As with Douglas fir, it can be PEFC-badged (though probably only by prior agreement), if so required for a UK specification.

6.1.7 ‘Western red cedar’ (*Thuja plicata*)

This is another of those really, really big West Coast tree species from the USA and Canada. It can grow to a height of well over 70 metres; with a diameter of around 2.4 metres, and that’s *big*! What is slightly unusual for such a large and very slow-grown tree, is that it is of a considerably lower density – only about 370 kg/m³ – than all of the other common softwoods. And also, as may be inferred from its low density, it is of much lower strength than all the other usual commercial softwoods. For these reasons, it is not used as a serious load-bearing structural timber, although it can be used for simpler constructions such as conservatories, where its high natural durability rating gives it the distinct advantage of being able to be used without preservative enhancement.

As you may be able to tell by now – since I have put its name ‘in quotation marks’ – it is *not* a true cedar, despite its obvious trade name. (True cedars come from the genus *Cedrus* – but of

course, you know that the timber trade don't always bother with niceties like that!)

The timber of Western red cedar is very distinctive in colour, having a reddish-brown heartwood which can vary in its actual colour tone from a sort of salmon pink to a dark chocolate brown, when freshly-felled; but then it settles down upon exposure to light to a bit more uniform sort of russet-brown colour. As I hinted at above – and quite unusually for a softwood – the heartwood of Western red cedar is rated as durable. It is also classed as being resistant to preservative treatment; although – like Douglas fir – it can take treatment well enough to enhance its natural durability rating to cope with more hazardous uses or just to increase its potential lifespan in service. And also very helpfully, it has a 'small' moisture movement rating.

As a final technical point on this particular timber: you will need to be aware that Western red cedar is quite acidic; and it will therefore accelerate the corrosion of ferrous metals which are in direct contact with it. Because of this property, either stainless, zinc-dipped or coated fixings must be used with it in any outdoor, or high humidity, situation.

Supplies of Western red cedar generally come to us from Canada, rather than the USA; so that they will often be CSA certified, where proof of Chain of Custody is required. But, as with other Canadian timbers, such material that is imported into the UK will now bear the PEFC logo.

6.1.8 Southern pine (*Pinus* spp – principally *Pinus elliottii* and *P. palustris*)

This timber is often referred to in the UK timber trade as 'Southern yellow pine': despite that 'common' name being discouraged, as likely to confuse (see 'yellow pine' Later in this same chapter). Its 'official' name in the USA is, more properly, just 'southern pine' – without the word 'yellow' inserted into it. It is not – as may be seen from the multiplicity of scientific names I have given above – just one individual species of pine: it is more correctly a species group, which actually consists of about five or six quite closely related species, all with very similar characteristics, that are sold under one common trade name. Southern pine is so called because it comes from the southern states of the USA: principally Louisiana, Texas, South Carolina and Florida. There is

some variation in the character of the wood itself, depending upon which individual species is being harvested from which forest area, but overall, it has enough 'consistency' to be regarded as a single type of timber.

There is a further 'historic' confusion with the name of this timber; in that it was formerly sold under the title of 'American pitch pine'. This can often, in my experience, catch out carpenters and joiners, who come across examples of its use in historic buildings (especially Victorian churches) and swear blind that they are dealing with genuine 'pitch pine', when the timber is really nothing of the sort. (Trust me on this: I'm a wood scientist!)

Southern pine – to now give it its 'proper' trade name – is a very dense and strong timber, for a softwood, that is, varying from 660–690 kg/m³ depending upon which exact wood species it is made up of. Which means it is about 20 per cent heavier (and also stronger) than our own, more familiar pine, which is European redwood.

Its botanically incorrect, but somewhat older, 'historic' name – pitch pine – suggests that it is very resinous (since 'pitch' is the American term for 'resin' – which is the word that we normally use in Europe). This fact makes the wood far less suitable for joinery work; where its very great tendency to exude resin can give trouble with surface coatings such as varnish or lacquer. (As an interesting aside: much of the world's production of natural turpentine comes from the resins extracted from trees in this species group.)

Like all of the true pines, Southern pine has a very reddish-coloured heartwood, surrounded by a pale sapwood; and usefully, its heartwood is rated as being moderately durable. Its sapwood, as with all true pines, is rated as permeable and is therefore very easy to treat with preservatives. In surface appearance, it has a very strongly-marked growth ring character; with pale yellow earlywood bands alternating with much darker, more resinous latewood bands. Its movement characteristic is rated as 'medium' – like most (but not all) pines.

Because this is one of the few softwood timbers that we import from the USA (rather than Canada, as most North American softwoods are), it will be covered by the Sustainable Forestry Initiative (SFI) in terms of its Chain of Custody credentials, rather than the CSA. And of course – as you should expect, by this stage in the proceedings – it will have a PEFC badge on it, if imported into this country as part of a requirement to meet a UK 'sustainability' specification.

6.1.9 Yellow pine (*Pinus strobus*)

This is another 'true' pine; and its 'proper' (indeed its only) name is yellow pine. It is imported into the UK – but not very often – from eastern Canada (Quebec and Ontario); although the tree itself can be found growing down the eastern seaboard of the USA; and even as far south as Kentucky.

Because it is a true pine, it shares many of the characteristics of all the pines. It has a pinkish heartwood (although this is quite pale, in comparison with most other pines) and a very pale creamy-yellow sapwood. Its growth rings are, however, much more inconspicuous than other commercial pine species, with little or no earlywood/latewood contrast to them. Also, unusually for a pine, its timber is hardly resinous at all, which makes it very good for domestic joinery work and even for fine cabinet-making. It is also unusual in that it has very low moisture movement characteristics (rated as 'small') and this factor makes it a highly sought-after timber for making industrial patterns (these are the original timber 'moulds' which are used for precision metal castings); since it is extremely dimensionally stable under damp, factory conditions.

Although it is easy to treat with preservatives, this particular characteristic is almost never called upon, since yellow pine is almost always used in indoor situations.

If so required – bearing in mind its more limited use in the UK – it can be 'sustainably' verified by the CSA scheme; and of course, badged by the PEFC in the UK, to meet our current way of doing things.

6.1.10 Species groups

Earlier, I touched on the species groups that are available: mostly from Canadian sources. These are generally groupings of botanically unrelated (or only distantly related) timbers, which have superficially similar characteristics; and which are collected together and sold commercially for a number of end uses. But they are not quite the same thing as, say, Southern pine, where very closely-related trees species are combined under a single trade name.

6.1.11 Spruce-pine-fir

This of course is not at all single wood species; yet it is a very common North American species group: being made up of quite a high number of individual species of true spruces, pines and firs (though *not* 'Douglas fir' – which of course is not a

‘true’ fir). However, these trees all grow together in vast stands, throughout huge areas of the USA and Canada, and primarily for ease of harvesting, they are graded and marketed together under one name. And the species group name itself is often abbreviated just to ‘SPF’.

The principal species that make up SPF are black spruce, Western white spruce, Engelmann spruce, lodgepole pine, Jack pine and alpine fir.

The main uses of SPF are principally in construction and in packaging; and it is for these end-uses that the timber is sometimes imported into the UK: almost always from Canada (although USA versions of both the species group and the structural grades exist). As far as ‘sustainability’ certification goes, it is of course available as CSA certified material: and if necessary, it can be PEFC badged for UK use.

6.1.12 Hem-fir

This is another North American species group, which comes principally from the western USA and British Columbia in Canada. It consists of Western hemlock and Amabilis fir (hence the name); and the two unrelated species are grown, harvested and sold together as a single product, once again, mainly in construction grades. It is presently quite rare to find it in the UK, owing to the UK’s currency situation making it currently too expensive when compared with European whitewood. And as with SPF; should it be required for use in this country, then the CSA can verify it and the PEFC can badge it for the UK.

6.1.13 Douglas fir-larch

This is the last species group that I want to mention here. It consists of Western larch (*Larix occidentalis*) mixed in with a proportion of ‘Douglas fir’; both of which are native to the Pacific Coast of the USA and Canada (but which, although they look very much alike and have similar properties, are not actually related to one another). More usually known simply as ‘DFL’, this timber is primarily seen in the UK market as construction grades: but as with other North American softwoods, there is not a large volume of it in the UK at present; mainly owing to its relatively high price as compared with other imported or British-grown alternatives.

With regard to its 'sustainability' credentials, the same situation will apply, vis-à-vis either CSA or SFI 'proof' – depending upon the particular country of origin – plus the use of the PEFC logo, if and when brought into the UK as certified stock.

Now it's time to give you a lot more detail on the hardwoods – which, as you are probably aware, will have a much greater range of colours, densities, properties and uses than the softwoods.

7

A Selection of Hardwoods Used in the UK: With Their Main Properties and Sustainability Credentials

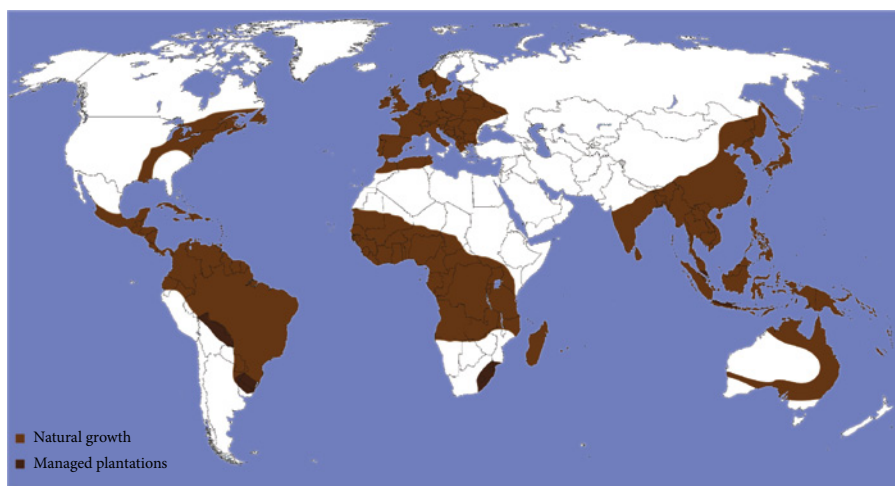


Figure 7.1 Approximate distribution of the world's hardwood forests.

It will have become apparent to you from reading the previous chapter, that the softwoods – owing to their somewhat simpler, much more basic cell structure – are fairly restricted in the ways in which they can ‘show’ themselves. They do not tend to have very great variations in colour, character, density and so on; whereas the hardwoods can – and indeed do – exhibit a huge range of colour, texture, figure, density and strength among the myriad of available species. And this much greater range of characteristics is almost limitless in its variety (and therefore in

its choice) that is available to the specifier. It may be a surprising statistic to know; but there are, quite literally, tens of thousands of species of hardwoods in the world, although in purely commercial terms, really only a few dozen different ones are ever imported regularly into the UK in any appreciable quantities.

So, what I want to do now is to concentrate on those hardwood timbers that are seen rather more regularly in use here in the UK, and many of them have been in more or less constant use in this country for many decades – or in some cases, for considerably longer. (But even though they might be perhaps ‘familiar’ timbers, it is still important to know quite a bit more detail concerning them, so that they can be considered and then selected and used correctly; based on their working properties.)

Then, by way of giving you some additional help and further widening both your ‘horizons’ and your choice of alternatives, I will add into my list some of the ‘newer’ timbers that are just beginning to make their mark (as it were) on the UK timber scene. That is not just so that you can find out more about them – perhaps for the first time – but also so that you can consider the possibility of using them in place of certain other timbers which may be becoming more ‘stretched’ in their availability. One very good reason for the more recent ‘popularity’ (and in some cases, a ‘re-popularity’ or even a ‘re-discovering’) of some of the lesser-known timbers, is more especially because they are becoming increasingly available as fully-certified (and thus of course ‘sustainable’) alternatives to some of the more ‘traditional’ timbers that are not always so readily available in quantity, as either PEFC- or FSC-certified stocks. That is perhaps a much more appropriate reason to include them; given the very particular context of this book, although having said that, whilst I am naturally delighted to see a number of ‘new’ timbers coming onto the general market, I am also a little disturbed at the way in which the uses of some of the more ‘traditional’ timbers are being subtly discouraged, by certain members of the ‘green’ fraternity.

7.1.1 ‘Vulnerable’ timbers

If you search the web for information on the ‘sustainability’ of certain types of timber – as I would always advise you to do, though with care – then you might find that a good many of those more ‘traditional’ hardwoods (and indeed, some of the

softwoods as well) are being described as 'vulnerable'. And perhaps there will also be some not-very-veiled criticisms about 'illegal logging' activities going on, in the countries of origin of those woods. And yet, if you look a bit deeper into it, you will find that most of those so-called 'vulnerable' timbers are actually currently available as FSC-or PEFC-certified species, and therefore they are perfectly 'safe' to specify and use without any qualms of conscience – though from the right sources, of course. So I would advise you not to be put off too much by this term 'vulnerable', since that is an example of what I regard as 'political scaremongering'. I am all in favour of conserving timber stocks and also of maintaining well-managed forests; but I am not at all in favour of discouraging people from using wood wisely, by surreptitiously making them believe that they are doing something wrong, when they are not.

Having cleared that little 'gripe' out of my system, I now want to give you a quick explanation of what I'm about to do, in this chapter on hardwoods. In terms of the facts about each timber, I will do as I did with the softwoods, I will first of all give you the trade name and the 'scientific' name of each timber that I intend to describe in detail. I will also tell you its common name, where that may be different from its trade name, plus any (sometimes confusing!) variants to that 'official' name. And please bear with me on this: I *always* believe in giving any timber its scientific name, so as to avoid any ongoing 'naming' confusion; where many timbers can seem to be related, but in fact aren't. And using the scientific name (or the 'botanical' name, as it is also known) is the only correct way to clear up any potential misunderstanding in a specification, so that there is absolutely no doubt as to which timber is being asked for. That is particularly the case, when being offered supplies of a 'new' timber under a strange and unknown name, which may then, on closer investigation, turn out to be something else, that we've known about all along (there are a good many examples of exactly this, in the following pages).

Once I have sorted out any confusion over names – and there is indeed some, believe me – I will then go on to describe the timber itself, in greater or lesser detail, depending upon what I have been able to find out about it; and I will point out any particular features or characteristics that may make it suitable for various end uses. (In some cases, there are things that may make it less suitable, for some very specific uses). I should also state here that I strongly recommend, if possible, that you

should try to obtain for yourself a sample of any timber that you're interested in specifying or using for a project. This is always a good idea with any wood; but it is doubly important with the hardwoods, since they are almost always used in some decorative way – even if they are also used in a structural capacity, as well. And in my opinion, getting a representative sample of any timber really is a 'must', especially if it is one you are not overly familiar with. However, as I warned you in an earlier chapter, just one single, small sample cannot hope to show you the great variety and range of colour and figure that the timber might actually exhibit when used in quantity, so a bit of caution is very much still required.

Finally – before I get on with the main 'hardwood knowledge' bit – I should say that, in the preceding chapter, you may have been aware that I listed the softwoods more or less in the order in which you would be likely to encounter them in 'commercial' life, putting all of the most commonly-available, or most often used, ones first. But as far as the hardwoods are concerned, there is no one individual species that tends to predominate in its use within the UK. Also, because any one particular hardwood species may generally be used in very much smaller volumes than any of the softwood species are, there is no real 'everyday' hardwood which takes precedence over any other, in my experience.

So I am simply presenting my selection of hardwoods below in alphabetical order. (And, as a bonus, that makes them easier for you to find and refer to, as well, especially where there are alternative names for the same wood).

7.1.2 Ash, American (*Fraxinus* spp)

This timber, as the name suggests, comes from North America, although it is only found in the eastern half of the USA and Canada. It is listed here as '*Fraxinus* spp' because American ash is really a 'collective' trade name; which means that a parcel can consist of timber from more than one actual species of wood, albeit that they are very closely related.

Sometimes these different species in the genus *Fraxinus* may be sold separately, in which case, they are usually given additional trade names, which relate to colours. *Fraxinus americana* is sold as 'white ash'; *F. pennsylvanica* as 'green ash'; and *F. nigra* as 'black ash' – or sometimes as 'brown ash'. In trading terms, the most likely single species to be sold as a separate parcel of timber is the last one: black ash.

American ash trees can reach about 30 metres in height and up to almost a metre in diameter. The wood is generally light in colour (almost white in *F. americana*, although it can be quite a bit darker in *F. nigra*); with the pale sapwood not clearly demarcated from the heartwood, although in the latter species the heartwood can sometimes have a grey-brown or reddish tinge to it. The grain of American ash is very straight, with very obvious growth rings to the cut surface; and it has quite a coarse texture.

In terms of its density, ash can weigh about 660 kg/m³ when seasoned (black ash is generally a bit lighter in weight, being about 560 kg/m³); and its heartwood is rated as only slightly durable, so it is not good for outdoor uses in its natural state; although it is reckoned to be easy to treat with preservatives. (But it's rare that anyone would bother to give ash any preservative treatment, since its predominant uses are for furniture, internal joinery and shopfitting.) It is classed as a 'medium' movement timber, which means that it is relatively stable. But as a timber for particular uses, its most outstanding feature is its toughness, a property which gives it extremely good shock resistance. So it is very suitable for hammer or pickaxe handles and it will be very resistant to cracking or breakage.

The USA's SFI (Sustainable Forestry Initiative) Scheme can certify supplies of ash for both domestic and export use; and of course, these particular supplies would come under the umbrella of PEFC when seen in the UK. However, there are stocks of FSC-Certified ash from the USA readily available in the UK at present.

7.1.3 Ash, European (*Fraxinus excelsior*)

This is a close relative of American ash, which grows all across Europe and even down into Asia Minor. The trees can reach a height of about 30 metres and a diameter of up to 1½ metres: so it can produce considerably larger boards than its American counterpart, if need be. In appearance, it is very similar to American white ash, although it may have a pinkish hue when freshly cut; though this soon fades. Very occasionally, the heartwood of some trees may be brown or black, but this is not due to any sort of rot – in fact, its cause is not really fully known – and such individual trees can command a higher price, especially when they are sliced into decorative veneers. European

ash is a little bit denser than American ash, averaging about 690 kg/m^3 when air-dried.

European ash also has good toughness properties – it's the best of any British-grown timber – and it's easy to work, on account of its straight grain. It is used for furniture, joinery and shopfitting; but also for tool handles and – almost uniquely amongst hardwoods – for the rungs of wooden ladders: also on account of its shock resistance. (There is a slight quirk, however, in relation to the use of slow or fast-grown material, where faster-grown timber is preferred for both tool handles and ladder rungs, because it is considerably stronger).

Continental supplies of European ash are currently available as FSC certified timber. And any British-grown material, where it may be certified, would normally be FSC-badged by the Forestry Commission, under the UKWAS process.

However, with regard to both British and European supplies, there is a fly (or rather, a fungus!) in the ointment: because European ash is very likely to become much more limited in the future, owing to the prevalence of the recently detected 'ash die-back' disease. This nasty tree sickness is caused by a fungus – *Chalara fraxinea* – which struck the UK's ash trees in a big way, as recently as 2012 (having previously been detected in Denmark, amongst other countries). The latest thinking, according to the Woodland Trust, is that a high proportion of the UK's estimated 126 million common ash trees may become infected; and unfortunately, infected trees usually die, rather than recover. So this virulent fungal infection therefore threatens to become the next 'Dutch elm disease': for those who remember that particular problem in the 1970s. (It so happens that ash trees on the Continent are also badly affected; and supplies of ash from Europe are thus already becoming limited: with Danish forests being particularly badly affected. On the positive side, there is some very recent research – as just reported in the autumn of 2013 – which has now 'cracked' the genetic code of certain individual tree specimens which have proven to be disease-resistant; so it is hoped that a solution to the long-term decline of ash trees all over Europe will eventually be found.)

7.1.4 Ayan (*Distemonanthus benthamianus*)

This is one of those timbers which were actually known about in the UK many decades ago, but which have been 'forgotten' about until recently, when the timber trade once again began

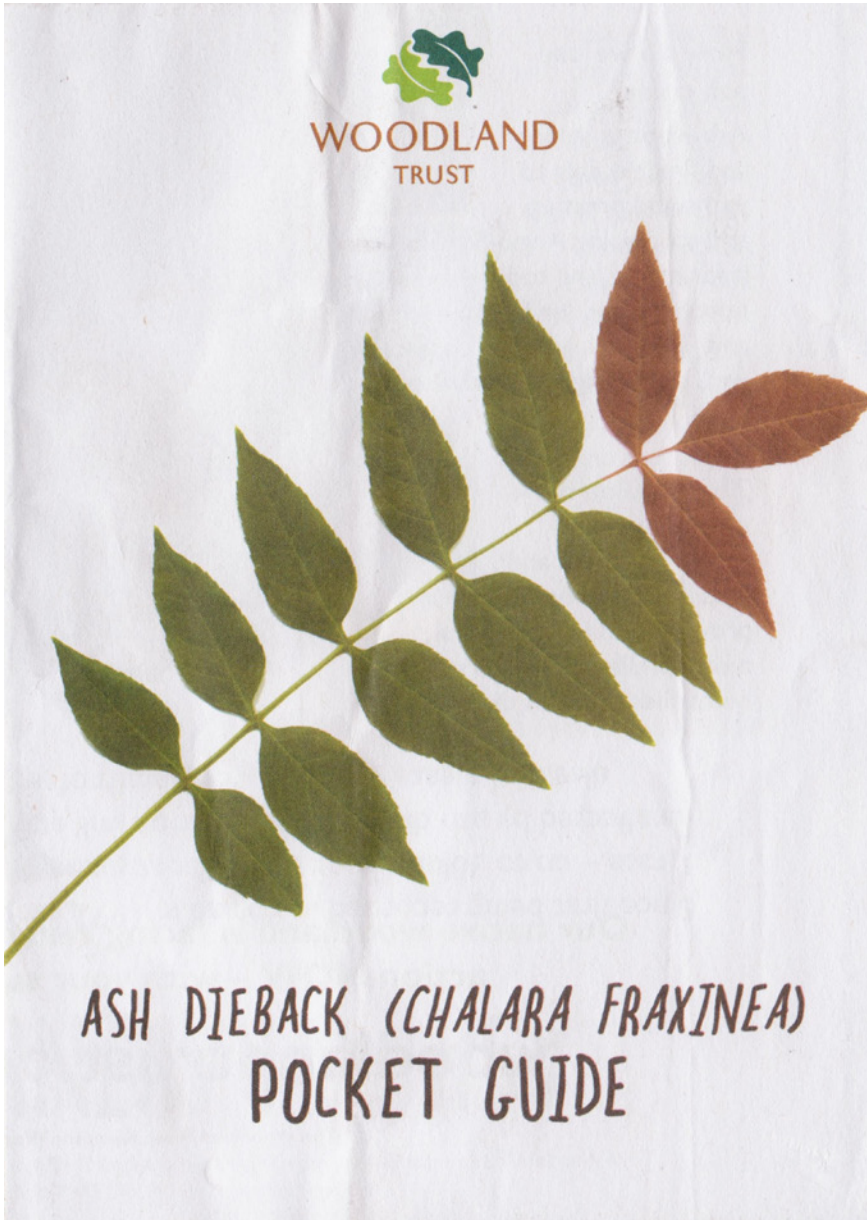


Figure 7.2 Leaflet published by the Woodland Trust about ash dieback, *Chalara fraxinea*.

searching for 'new' timbers to replace those which were becoming harder to get hold of. (Much the same thing happened immediately after the Second World War, when timber supplies from some parts of the then 'British Empire' were still hard to obtain: and 'lesser known species' began to be tried out as substitutes for the more familiar woods, during the 1950s.)

As a timber, ayan looks quite like idigbo (qv) in its general colour and overall appearance, though a little darker in tone. It also comes from the same part of the world as idigbo does, that is, West Africa. In its native countries it may also be known as 'movingui'.

Ayan is a moderately heavy timber, weighing in at about 680 kg/m^3 in density when air-dried, though some parcels can be somewhat heavier. It is rated as having small movement characteristics and moderate durability. It is also prone to slight interlocked grain. As with idigbo, it can be used as an alternative to oak and it is also similar to idigbo in another respect, in that it contains a yellow colouring matter that can create staining of cloth or other items, under damp conditions.

Ayan is beginning to find some favourable use as a joinery timber; and it has been tried for cabinet making too; although its tendency to have interlocked grain can sometimes make it difficult to work with.

Ayan is now available in the UK in some FSC-certified supplies. However, you may find that there is some confusion about it, since it is also being shipped under its Ivory Coast name of 'movingui', but please don't let that change of identity fool you.

7.1.5 *Basralocus (Dicorynia guianensis & D. paraensis)*

This lesser-known South American timber is found in Brazil, French Guiana and Surinam. It is a very plain, brownish-coloured timber, occasionally having a purple colouration to it. It is mostly straight grained, with little or no tendency for interlocked grain. It is reasonably dense, averaging about 790 kg/m^3 and it is rated as very durable, with medium movement characteristics. It is often used for marine constructions; and its very high silica content is considered to be a good advantage in this respect. However, that particular attribute also means that it will blunt cutter blades very quickly; and so it is less likely to be used for joinery or furniture – at least in this country. It is currently being tried in the UK as an alternative

to some other 'heavy duty' timbers, such as opepe (qv) or greenheart (qv).

FSC-certified supplies of basralocus are currently available as exports to the UK; especially from its sources in Surinam.

7.1.6 Beech, European (*Fagus sylvatica*)

There are a good many different species of beech growing in the temperate parts of the world; but the only commercially significant one – at least in UK usage terms – is the European variety, which grows throughout most of northern and central Europe and into western Asia. There are some supplies of British-grown beech used in the UK, but by far the greater proportion of the commercial timber used here comes from France, Germany, Denmark and Romania. Much of the imported European material is steamed, which then gives it prominent pinkish tinge; but in its natural state, beech is quite a pale, light-brown timber, with no differentiation in colour between its heartwood and sapwood. It is classed as not durable, although it is, as a compensation, classified as easy to treat with preservatives. However, in the same way as with ash, it is very unlikely to be employed for any outdoor uses (except perhaps for a few fence posts from some small, home-grown sawmill).

Beech trees can grow to 30 metres in height and about 1.2 metres in diameter; and the density of the timber is about 720 kg/m³ when seasoned: which is pretty high. Mainly because of its high density, it is a very strong timber and it also has very good steam-bending properties; which makes it an ideal choice for furniture and also for the manufacture of plywood (or more usually, laminated 'bentwood'). Beech has a very fine and even texture, which takes paints, stains and adhesives very well. These factors are also strongly influential in making it the favourite wood for furniture manufacture, although it is also used for traditional tool handles, brush backs, children's toys and turned goods.

But please be careful when using beech for certain purposes: there is one property of this timber which must be fully understood; and then dealt with, using some caution, because it has very large 'movement' characteristics. Therefore for any use where any major, or widely-varying seasonal, changes in atmospheric humidity are anticipated; great care must be taken with any design and detailing. Thus in any design where overlaps, butt joints or tongues and grooves are a feature, beech can

be somewhat problematic; and beech flooring – although highly popular – can sometimes cause difficulties, if its equilibrium moisture content is not carefully considered before the final design and its method of installation and fixing are decided upon.

Supplies of both FSC and PEFC-certified European beech are available from France and Denmark; whilst Germany and Romania can supply PEFC-certified timber. British-grown material may occasionally be available through UKWAS; and if so, it will then bear the FSC logo.

7.1.7 *Bilinga*: see *Opepe*

7.1.8 *Birch, European (mainly *Betula pubescens*)*

Birch is a fairly small diameter tree, which grows all over a large part of Europe and it is most common in northern and eastern Europe – especially throughout Scandinavia, Russia and the Baltic States – where its main use is for the manufacture of very high-strength and smooth, clear-faced plywood. In fact, birch is very little used in its ‘solid’ timber form in the UK and it is almost never seen here, other than as plywood. As a timber, it is very pale – almost white – with a very fine texture and only a very slight degree of surface character, which makes it very suitable for overpainting, or for adding paper or vinyl overlays onto. But the wood is not at all durable, and so it would need to be treated with a preservative when used out of doors and that is not an easy thing to achieve with large sheets of plywood. Therefore, it is mainly confined to internal uses such as shopfitting, or as a structural component in engineered I-beams.

Supplies of PEFC-certified birch plywood are available from Finland; with further supplies of both PEFC- and FSC-certified plywood now readily available from Latvia and some other Eastern European sources.

7.1.9 *Cherry, American (*Prunus serotina*)*

This is one of the really good, highly decorative hardwoods available from the eastern side of the USA. It is a really attractive timber; having a pale sapwood and a pinkish-brown heartwood that contains darker lines within it; and it can often show a greenish tinge to it as well. It has a very fine texture and it takes polishes and other finishes very well; which makes it extremely prized for attractive furniture and paneling: often seen in veneer form. Cherry produces fairly small

trees (for a hardwood, that is), up to about 20 metres or so in height and up to only about 0.6 metres in diameter. Its density is around 600 kg/m³ when air-dried. Because of its quite small tree size, cherry is generally only available in narrower boards; and its uses are confined to cabinet making and certain specialist uses, such as parts for musical instruments. But it is, as I have said, also produced in veneer form, which means that its attractive figure is seen when it is used in shopfitting, for example, where the veneers may be bonded to a suitable substrate (such as MDF or HDF).

Cherry can be certified under the SFI Scheme in the USA (and thus of course, with a PEFC badge, if so required, when imported into the UK). However, separate FSC-certified stocks of American Cherry are readily available in the UK as well.

7.1.10 Chestnut, sweet (*Castanea sativa*)

This timber actually comes from the same tree as the edible chestnut (the one that gets roasted on the fire at Christmas time). Sweet chestnut grows throughout central and southern Europe and, although it is not native to us, it has been planted in Britain for centuries, and it was once very popular as a coppice-grown timber, for producing poles. The tree can grow up to 30 metres in height and about 1.5 metres in diameter and its timber closely resembles European oak in outward appearance; but because of its particular type of wood-cell structure, it has much less tendency to split or crack when exposed to the weather. It has a pale sapwood and a golden-brown heartwood; and it is quite coarse in texture although straight grained and quite strong. It is a bit less dense than oak, being about 540 kg/m³ when air-dried; and with a good natural durability rating, plus 'small' movement characteristics. Chestnut is therefore very suitable for external joinery, but it is becoming harder to find in any great quantity; and it seems a great pity to me that it is not very readily available in the UK; since it is an under-rated timber with good, all-round properties.

When UK chestnut is available – and it is somewhat limited in its supply, as I have said – it is possible to have it FSC-badged via UKWAS, although my present experience is that anyone intending to specify UK-sourced timber for a particular job would need to enquire about availability in advance. However, some supplies of European-sourced chestnut are presently available in the UK, as PEFC-certified timber.

7.1.11 Cupiuba, see Kabukalli**7.1.12 Ekki (*Lophira alata*)**

This is a tropical timber which grows in several West African countries. Ekki is the name we use for it in the UK; but in Francophone countries, it is always called 'azobé' (just to be difficult, you would think). It grows as a very large tree, up to 55 metres in height and 1.8 metres in diameter: with a pale sapwood and a very deep reddish brown – or even chocolate-brown – heartwood. It is an extremely heavy timber, with a density somewhere in the region of 1000 kg/m³ when air-dried – and occasionally even heavier. Unsurprisingly, it is very strong, but it is also very difficult to work with, not least because of its highly 'interlocked' grain; and it is also very coarse in texture. It is rated as very durable and thus needs no preservatives, when used for such things as lock gates and piles for jetties or docks, where it is in permanent contact with water. It has also been tried in the UK for outdoor decking; although in my own experience, it can be a bit prone to distortion: mainly through 'spring' (i.e., bending sideways) unless great care is taken in its selection.

There are FSC-Certified supplies of ekki available in the UK; and there are also some stocks of third party, *legally verified* (but only legally, remember – not sustainably – verified) timber, available in the UK as well.

7.1.13 Eucalyptus: see 'Red grandis'**7.1.14 Eveuss (*Klainedoxa gabonensis*)**

This is one of the 'newer' timbers to come into the UK: once again – as seems to be the case with these things – primarily for heavy construction and marine works. It is a very hard and heavy timber; being orange-yellow when freshly cut and then fading to dark brown with black streaks, upon exposure to light. Its density is well over 1000 kg/m³ when air-dried and it is rated as very durable. It comes from many different countries in West Africa; but most commercial supplies are currently being obtained from the Ivory Coast.

Eveuss is now available here, imported as fully FSC-certified timber from the Ivory Coast.

7.1.15 Gedu nohor (*Entandrophragma angolense*)

This timber is a very close relative of both sapele and utile (qv), coming from the same sources, of Nigeria and Ghana; and it is

also known as 'tiamá' when shipped from the Ivory Coast. It has a lower density than either of its above-mentioned relatives – about 540 kg/m^3 when air-dried – and it is not so highly decorative as those two timbers, either. It is a red-brown timber with slightly interlocked grain; and it has small movement characteristics, so it is a very useful timber for internal joinery. However, it is only rated as being moderately durable; and yet it is also extremely resistant to preservative treatment, so it is not really suitable for external joinery uses.

Gedu nohor has been known about in the UK for decades; but supplies are only just beginning to come in again with any regularity; and it is now available as FSC-certified timber from the Ivory Coast – although currently under its 'alternative' trade name of 'tiamá'.

7.1.16 Greenheart (*Ocotea rodiaei*)

This is also another very hard and extremely heavy, tropical timber and this particular one comes from the northern part of South America; from Guyana and Honduras. Trees can grow up to 40 metres in height and up to about a metre in diameter. Its density is a quite astounding 1030 kg/m^3 (even when it's been dried): and you won't be surprised to learn that it is the hardest and heaviest of all the timbers that are commercially available today. In appearance, it is dark olive-green (hence its name), with a pale green or yellow sapwood; which is almost never seen in commercial supplies coming to the UK. Its heartwood is rated as very durable; but it is quite difficult to work with anything except power tools; and in the UK its use is usually restricted to heavy engineering uses such as lock gates, jetties and so-called 'way beams' (for use under the rails, on railway bridges).

Supplies of FSC-Certified greenheart are now available from Honduras.

7.1.17 Guariuba (*Clarisia racemosa*)

This timber grows in Brazil; and it is one of the lesser-known species now being imported from that part of the world. As a timber, it has a striking golden-brown colour (fading from yellow-brown when freshly felled) and it has an attractive figure when cut in certain ways. However, it is very dense – around $1,000 \text{ kg/m}^3$ – and it may sometimes suffer from interlocked grain, though its grain is normally much straighter. It may sometimes contain large amounts of silica, which can improve

its durability, but will decrease its generally good working properties, by blunting cutters rather quickly. It is rated as moderately durable to durable (depending upon its silica content) and it is judged to have medium movement characteristics.

Guariuba is mainly used for heavy engineering uses, on account of its high density and reasonable durability – which is often enhanced by its silica content and it is being tried as an alternative to the more ‘traditional’ engineering timbers, for marine and freshwater construction projects.

It is presently available as FSC-certified material from Brazilian sources.

7.1.18 Idigbo (*Terminalia ivorensis*)

Idigbo is a tropical timber which is found principally in Nigeria and Ghana. Just as with other timbers of West African origin, there is an alternative French name for it, which is ‘*meri*’. It is a very tall tree, reaching a height of 45 metres and with a diameter of up to 1.2 metres. The heartwood has a yellow or light yellowish-brown colour, and it has a slightly paler-coloured sapwood. It can have a slight tendency for interlocked grain, although usually it is quite straight grained and therefore quite easy to work with and it has a medium-coarse texture. It has very strongly-marked growth rings (quite an unusual feature in a tropical hardwood); so when it is flat-sawn, it has a character that some people have compared to oak, which is the main reason why it is quite often used as a substitute for oak, especially by shopfitters. Its popularity as an oak substitute may well be because of its colour and overall appearance, but it also may be on account of its movement characteristic: which is rated as small; which means that it is very stable in service.

Idigbo is extremely variable in its density: ranging from as low as about 370 kg/m³ up to as high as 740 kg/m³ when seasoned and this is also a very unusual thing to find in a tropical hardwood; where density is typically fairly constant in any given wood. Like true oak, it is rated as durable, so it needs no preservative when used in situations such as external joinery. Another characteristic that it shares with oak is its tendency to corrode iron fixings or fittings when it is wet; but it also contains a yellow substance (not properly speaking, a dye), which can ‘bleed’ out of the wood’s surfaces in wet situations – so it is not recommended for kitchen equipment (and especially not for chopping boards or draining boards; although wooden draining boards seem to be back in fashion once again).

Idigbo can be obtained in FSC-certified supplies if required, from certain UK importers; though quite often only on forward order.

7.1.19 Iroko (*Milicia excelsa*)

This is another tropical timber, whose growth range extends across into East Africa, as well as growing with many other commercial species in the forests of West Africa. There are a few other local or 'native' names for this wood, but iroko seems to be the one 'fixed' name that all of mainland Europe uses when trading in it.

Iroko is a very large tree indeed; reaching about 50 metres in height and up to 2.5 metres in diameter. The wood is also quite heavy, averaging 640 kg/m³ in density when air-dried. It has a small movement rating, which makes it very suitable as a joinery timber: and that is especially so when coupled with its rating of very durable; which means that it can be used out of doors without any preservative treatment. The colour of the heartwood is yellowish-brown to brown, with quite a pale sapwood. It has a fairly irregular grain structure; often interlocked and with a medium-coarse texture. Another very useful attribute with this timber is its good resistance to acids, making it suitable for harsh end-uses, such as laboratory furniture.

There are good stocks of FSC-certified iroko readily available in the UK, from quite a number of UK-based hardwood importers.

7.1.20 Kabukalli (*Goupia glabra*)

This timber has been known about for decades; but it is only now being re-introduced into the UK from Guyana; where it is known as 'cupiuba' – although its 'official' name is supposed to be kabukalli. It also grows in Brazil; but at present, commercial parcels are coming to us from Guyana. The wood is light reddish-brown, darkening on exposure to UV light; and it is quite plain in its appearance. It is rumoured to have an unpleasant smell when freshly cut, but this fades after drying. It is a very hard and heavy timber, averaging about 830 kg/m³ in density when air-dried; and it has a coarse texture, with interlocked grain, which makes it difficult to work, for anything other than heavy construction uses.

Supplies of kabukalli are now becoming available in the UK, as fully FSC-certified material, from Guyana – though the timber may be referred to as 'cupiuba', depending upon the supplier.

7.1.21 Kapur (*Dryobalanops* spp.)

Kapur is the commercial name for this timber, which comes from a number of different species of the same genus (one species of which, incidentally, produces camphor oil: and it is sometimes known as 'Borneo camphorwood'). It is related to keruing (qv) since both are in the family of dipterocarpus trees. Present supplies of kapur come to us principally from Malaysia; but the various species grow throughout the whole of that Far Eastern region (including of course, Borneo).

A heavyweight timber, it has an average density of about 770 kg/m³ when air dried, although this can vary considerably, especially where different species are shipped under the one trade name. It is rated as very durable and it has medium movement characteristics. Because of its coarse texture, its primary uses are as a constructional and heavy engineering timber; although its use in the UK is presently restricted to decking. As with a number of other timbers with an acidic nature (see oak, for example), it can corrode iron fixings and cause blackish staining when in contact with ferrous metals under damp conditions.

There are certified supplies of kapur being brought in from Malaysia; both as PEFC-badged material and – look for it in the future – with MYTLAS verification, as fully legally-sourced timber.

7.1.22 Keruing (*Dipterocarpus* spp.)

This timber comes from a wide area of the Far East, growing in Burma, India, Thailand, Malaysia and the Philippines: but our supplies generally come to us from Malaysia. Keruing is sometimes given the local name that applies to it, in its different places of origin, such as 'gurjun', 'yang', 'apitong' or 'eng' (they are all the same wood, basically), but keruing is the name always used for exports of it to the UK. The designation 'spp' after the scientific name means that keruing as we know it is not one individual species of timber, but comes from a number of quite closely-related trees from the same general forest area.

Keruing is a plain, brown-coloured timber; without a hint of any attractive figure and its trees can grow up to 60 metres in height and 1.8 metres in diameter. The wood is commonly deep red-brown to dark brown in colour, and it is moderately coarse in texture, with almost no tendency to show any interlocked

grain. Its density is about 750–800 kg/m³ when seasoned; although it can vary quite a bit, both above and below that range. It is rated as being only moderately durable, and its movement characteristic is given as being medium to large (all of those last three properties are so variable because it is not one particular wood species; but a range of related species, as I said). It is also well known for its tendency to exude large amounts of gum: which means that it is not especially good when used for joinery purposes. It is also rated for structural use, although I must say that it is very seldom used for roof trusses or load-bearing beams in the UK, in my experience.

As far as its ‘sustainability’ credentials are concerned, because we get our supplies of keruing primarily from Malaysia, it can be obtained with full MTCC certification: and of course, that means it will now bear the PEFC logo, when seen in the UK.

7.1.23 Mahogany, African (*Khaya ivorensis* and *K. anthotheca*)

This timber – which is a ‘true’ mahogany – is found throughout West Africa; and commercial supplies to the UK consist mostly of the first-named species, *Khaya ivorensis*. As a tree, it grows up to 60 metres in height and 1.8 metres in diameter; with a density of around 700 kg/m³ when air-dried. The timber is often quite pink when freshly sawn, but then fades to red-brown, and its sapwood is creamy-white or yellowish. It very often has interlocked grain; and it also has a moderately coarse texture. Its movement characteristics are described as small and its heartwood is rated as being moderately durable: so it is an excellent timber in many respects for external joinery.

African mahogany can be found in limited supplies as FSC-certified timber, imported from West Africa. It should not, of course, be confused with American mahogany (see below).

7.1.24 Mahogany, American (*Swietenia macrophylla*)

American mahogany (which is often referred to as ‘Brazilian mahogany’, because that is where most of the somewhat limited commercial supplies come from these days) grows in many parts of northern South America. It is really, one could argue, the ‘proper’ mahogany these days, since it is very closely related to the original ‘Spanish’ or ‘Cuban’ mahogany – which,

although no longer used commercially, came to Europe from the West Indies – and it was *Swietenia mahagoni*, which of course gave that timber, and its close relatives, the very distinctive trade name.

As a tree, American mahogany grows to about 30 metres high and about 1.8 metres in diameter. It is, to my mind, a very attractive wood; being light red-brown in colour and with a high lustre to it. It does not usually suffer from interlocked grain – although in fact, it frequently shows some other very attractive variations in its grain: including roe, curl, mottle and blister figures. (This is not the book to explain those particular terms, I'm afraid.) Its density when air-dried is about 540 kg/m^3 ; and it is rated as durable: with its movement characteristics being rated as small. It is therefore another timber which – when available – is extremely suitable for use as exterior joinery.

American mahogany – especially Brazilian mahogany – is on the 'CITES 2' list, which means of course that you *are* allowed to use it; provided that it has been obtained legally, and with all the relevant felling and export licences. Currently, there are some fully FSC-certified supplies of this timber being brought into the UK, but it is not widely available, since many UK importers prefer not to have the 'hassle' of dealing with the more vociferous parts of the environmental lobby.

7.1.25 **Maple (*Acer saccharum*)**

Also sometimes referred to as hard maple or rock maple, this is a very hard-wearing and tough timber, which comes from eastern Canada and the northern and eastern states of the USA (where it is also 'tapped' for its sap, which is boiled down to produce maple syrup). The wood itself is creamy-white in the heartwood, with an occasional reddish tinge; and the sapwood also is a pale, creamy-white colour. Despite its very pale appearance, the heartwood of maple is rated as moderately durable. Its density is about 720 kg/m^3 when air-dried; and it has medium movement characteristics.

It has excellent resistance to wear and abrasion; and for this reason, rock maple is a very good flooring timber, especially for dance floors and other public areas, such as squash courts and bowling alleys.

Maple may be available as a certified timber in the UK via the CSA scheme from Canada (with the PEFC logo of course); but it is also available, often on forward order, as an FSC-certified timber.

7.1.26 *Majau (Shorea spp)*

This is a local name – from sabah – for the wood also known as dark red seraya; and that itself is an alternative name for dark red meranti (qv), when it is shipped from that particular part of the world. It is claimed (by the importers) that majau is of generally better quality than ‘normal’ seraya or meranti.

Supplies of majau are presently available in the UK as third party ‘legality only’ certified timber: in other words, with a certificate verifying their legality of logging and export, but not claiming sustainable forestry practices in any way.

7.1.27 *Massaranduba (Manilkara spp.)*

Massaranduba is another of those ‘newer’ South American timbers, which has been introduced into the UK primarily as a decking timber. It is a very hard and very dense wood, having a dark, mid-red-brown colour: in fact, it looks not unlike a somewhat heavier hybrid, somewhere between iroko and mahogany. It has some tendency towards interlocked grain; and it is medium-coarse in texture, with a very good natural durability rating; and it is rated as medium in its moisture movement.

To date, massaranduba has mainly been imported into the UK for use as decking: where it performs extremely well.

It is available as FSC-certified material in the UK; but so far, only in decking profiles and dimensions, so it is not generally available at the present moment as sawn timber for any other purposes – which is perhaps a pity, given its excellent properties for other outdoor uses.

7.1.28 *Meranti (Shorea spp.)*

This wood is not one single type of timber, but a group of over 20 different species, all coming from the same genus, which is *Shorea*. As a ‘tree group’ meranti grows in a very wide geographical area all over South-East Asia; principally in Malaysia and Indonesia. A very similar timber (with some species from the *Shorea* genus and some from a couple of closely-related genera, *Parashorea* and *Pentacme*) which grows in the Philippines is sold in the timber trade as lauan.

Commercial supplies of meranti are divided into two broad categories, based notionally on their colour and density: and these are usually sold as light red meranti and dark red meranti; although there is a bit of ‘overlap’ in the way they are defined, so

it is quite possible for a mid-range timber to be classified as either 'light' or 'dark' (According to the selection criteria: light red meranti is reckoned to vary in density from around 400–640 kg/m³, whereas dark red meranti is supposed to fit into a range from 580–770 kg/m³. So that means there is a mid-point, around the 580–640 kg/m³ mark, where any individual piece of timber could theoretically be allocated into either one group or the other).

The natural durability of meranti (because it comes from more than one species) varies from only slightly durable in the light red variety, to durable in the dark red variety, and so it is really important to be sure just what you are getting. (For this reason, it is required that meranti should be treated with preservatives when used for external joinery; since one cannot be sure of its exact durability rating, if it is left untreated.)

Meranti has been used for a good many years in the UK as a substitute for true mahogany, but it is prone to quite heavily interlocked grain; and it does not have any of the more attractive variations in figure that true mahogany can show (see above). However, it is a very popular (and relatively cheap) timber for joinery – both internal and external – and also for shopfitting uses.

Many of the numerous species of *Shorea* will also be found in the large volumes of less expensive (and somewhat variable quality) far-eastern plywood, that is imported into the UK each year.

On the 'sustainability' front: both Malaysia and Indonesia are now much more reliable than they used to be; both in terms of 'legal' and 'sustainable' supplies of meranti. The MTCS will now have its export material 'badged' by the PEFC for any UK supplies of its Chain of Custody Certified material; and there are good stocks of PEFC-certified meranti now available in the UK: as well as there now being the potential for legally-sourced meranti from Peninsular Malaysia under its MYTLAS regime.

Also – as I explained in an earlier chapter – there is now a fledgling FLEGT VPA Scheme between the EU and Indonesia: which guarantees at least the *legality* of any supplies of meranti from that country, although that will most likely point towards its sustainability as well, since, as I also explained earlier, good forest management is a very strong component part of Indonesia's whole FLEGT/SVLK scheme.

7.1.29 *Missanda (Erythrophleum guineense and E. ivorense)*

This timber is another one of those which has had a long association with the UK; and is only now coming back into use here. It is a West African timber, coming from Nigeria and

Ghana, amongst other countries in that part of Tropical Africa; and it is also known as 'tali' when coming from the Ivory Coast. It is a very attractive timber; being reddish brown and darkening to a rich red-brown on exposure to light. But it is very heavy – being about 900 kg/m^3 in density when air-dried – and it has a coarse texture, with a tendency to interlocked grain and so it is mostly used for heavy construction and marine work, and occasionally for very hard-wearing industrial flooring. It is rated as very durable.

Missanda is now becoming available from the Ivory Coast (although you may only see it shipped under the alternative name of 'tali') as fully FSC-certified material.

7.1.30 *Movingui*: See *ayan*

7.1.31 *Oak, American Red (principally *Quercus rubra* and *Q. falcata*)*

This is another of the temperate hardwoods of the eastern USA. Despite its trade name, the actual colour of the wood itself may not be very red, although the heartwood can sometimes show a reddish tinge: but this is by no means guaranteed. Its density is about 770 kg/m^3 when air-dried: which is slightly higher than both American white oak and European oak. It is reckoned by furniture makers and interior designers to be not as good as white oak for decorative uses.

Unusually for a true oak, American red oak is rated as only slightly durable in its heartwood, which means that it is not suitable for exterior joinery unless treated with preservative. It is also quite unusual in respect of another basic wood property, it is completely porous – which makes it totally useless for barrel making. (In fact, that's the only reliable way to tell the difference between red and white oak – not by the colour of the wood – because if you take a small piece of oak and try to blow through it, along the grain, then red oak will allow you to do so; whereas white oak will be 'blocked up'.)

7.1.32 *Oak, American white (principally *Quercus alba*, *Q. prinus*, *Q. lyrata* and *Q. michauxii*)*

As you can see from the plethora of scientific names listed above, American White Oak is not just one sort of oak, but a mixture of at least four related species: so once again, it is a trade name for a 'species group'. And despite its name, the timber is not really 'white', but pale golden-brown in its heartwood, with a paler,

whitish sapwood. However, it can sometimes show a pinkish tinge to the heartwood and therefore wood colour is *not* a reliable indicator of the timber type. (See above for the only way to separate the two oak types.)

Its density is about 750 kg/m^3 when air-dried and it is very straight-grained, although it is quite a coarse-textured wood and since it is ring-porous, it shows a very prominent growth ring figure on all flat sawn surfaces. Like all of the true oaks, the timber has very deep and broad rays, giving rise to a highly attractive 'silver' figure on quarter-sawn surfaces, which is often made use of in decorative veneers. Its heartwood is rated as durable and it is also a moderately strong timber. In fact it has – just within the past decade – been tested and approved for use in the UK and Europe for structural use; and it has been allocated a temperate hardwood strength class. Because American white oak – unlike its red cousin – is 'tight', it is used extensively for cooperage by the whiskey distillers of the southern states.

Both white oak and red Oak are available from America as certified timber through the USA's SFI scheme: which – as you may expect by now – will be 'badged' under the aegis of the PEFC, here in the UK. American white oak is also available as FSC-certified timber from certain importers.

7.1.33 Oak, European (mainly *Quercus robur*)

This is the oak that we are probably most familiar with, in the UK. As a tree, it grows right across Europe; and here, we buy timber from many European sources and so it tends to take the name of those sources as its trade name. Hence we may hear of French oak, Danish oak, Romanian oak, and so on. 'English oak' – as the name implies – comes from our own forests; and it is in much more limited supply these days. It also tends to be generally less straight-grained than its imported equivalent, but then it can often have a more interesting 'character' as a consequence.

European oak – as the timber overall is collectively known – is slightly less dense than its American cousins; being about 720 kg/m^3 when air-dried; and it is not quite so strong. Its heartwood is a golden, yellowish brown, and it has a wide and light-coloured sapwood, which must, of course, be removed if the timber is to be used outdoors without any preservative treatment (since it is only the heartwood which is rated as durable – a fact which specifiers and users of oak too often tend to overlook).

The uses of oak cover all the usual possibilities: from furniture making, to joinery – both internal and external – to construction. Its one potentially serious drawback, which needs some thought and care when using it in certain situations, is that it is a very acidic timber, which means it will severely corrode any unprotected iron fixings that may be used in contact with it under damp conditions; especially in outdoor situations.

Because oak is available from many different sources, it can be found as FSC- or PEFC-certified timber from a number of different places; although not *all* European oak is necessarily fully certified as being completely ‘sustainable’, some of it may only be third party certificated as being ‘legally harvested’. Therefore, it is wise to check the availability of particular supplies before committing to a specification, or to any large project in which it is intended to be used.

7.1.34 Obeche (*Triplochiton scleroxylon*)

This is another West African timber and – like most of the woods which come from that part of the world – it has many alternative trade names: the most common of which is ‘wawa’. It grows as a very large tree; up to 55 metres in height and 1.5 metres in diameter, but despite its huge size, the timber is in fact very lightweight, being only about 380 kg/m³ when air-dried. The wood itself is very pale in colour, with no clear distinction between its heartwood and sapwood and of course (as you probably know by now) this means that it has no great degree of natural durability, being rated as only slightly durable. However, it has a small movement rating, which makes it very suitable for internal joinery or furniture uses, where its stability is an asset.

Obeche has strongly interlocked grain and quite a coarse texture, yet it is very ‘plain’ looking; so it tends to be used where appearance is not important, for example, in the framing of upholstered furniture, or as the bench seating in saunas.

Supplies of FSC-certified obeche are available in the UK, via a few importers, but it is not used very extensively at present.

7.1.35 Opepe (*Nauclea diderrichii*)

This is yet another West African timber, which has been very well known and used in the UK, for well over 50 years. (It is also now being marketed under its lesser-known name of ‘bilinga’: which is what it is known as in Cameroon.) It is a very large tree,

growing up to 50 metres in height and 1.5 metres in diameter. It has a pale sapwood, but with a very distinctive heartwood, which is often bright yellow in colour when freshly-felled; then fading to a somewhat darker orange tone on exposure to UV light. Its heartwood is rated as very durable, although, because of its quite coarse texture and its tendency to interlocked grain – not to mention its high density, which can be up to 750 kg/m³ when air-dried – it is used almost exclusively for structural, heavy engineering applications such as jetty piles and wharf timbers; as well as for lock gates and occasionally for railway sleepers. Opepe has also been used for decking, where its good durability rating means that it needs no preservative treatment.

Imported, FSC-certified opepe is readily available from stock, from a few companies in the UK (and also, from a very nearby source – the Netherlands); and some PEFC-certified supplies can be obtained from certain other sources, on forward order.

7.1.36 *Padauk (Pterocarpus soyauxii)*

It should more properly be called ‘African padauk’ – to avoid confusion with related species from the same genus, which come from completely different parts of the world (Andaman padauk and Burma padauk). This timber has been used on and off for many years in the UK, mostly for turnery, carving and some high class internal joinery items. Originating from West Africa, it is a very striking timber, being vivid red in colour when first cut; but toning down to a bright, purple-red or dark purple-brown tone, after exposure to UV light. It is rated as very durable; and it has exceptionally small movement characteristics; so it is eminently suitable for use in external joinery as well as its more ‘traditional’ uses.

Although not currently used here in any great quantity, African padauk is nevertheless available in the UK as a fully FSC-certified timber.

7.1.37 ‘Red grandis’ (*Eucalyptus grandis*)

This is a good example of one of the ‘new’ timbers which has quickly carved out a niche for itself in the particular end-uses of furniture and joinery. It is a member of that enormous genus of tree species – eucalyptus – which of course originates from Australia. And yet, in commercial terms, a considerable number of varieties of eucalyptus have been planted in many places throughout the world – including *E. grandis* in vast areas in

South America, most notably in Uruguay – where it can achieve a diameter of up to 600mm in a timescale of 30 years or less. And that is pretty good going for any hardwood!

It is quite an attractive timber, with a sort of mahogany-like red-brown colour to it and it has a moderately fine texture, without suffering from any interlocked grain; although it does not have a very strong decorative ‘figure’ to it, which gives it a rather plainer character than ‘real’ mahogany has. It is reckoned (on the basis of tests) to be durable; and its movement characteristics are considered to be medium: therefore ‘red grandis’ should be very suitable for use in external joinery, as well as for its currently popular indoor uses, as noted above.

The really big ‘plus’ with ‘red grandis’ – and the reason why its use has taken off so quickly in the UK – is the fact that it is being grown in FSC-certified plantations and so it is just about as ‘sustainable’ a timber as we are likely to get from South America, at the present time.

7.1.38 Sapele (*Entandrophragma cylindricum*)

This is probably the one hardwood, apart from oak, which just about every adult in the UK will have seen at some time in their lives, though quite probably without actually realising it. That’s because sapele is almost universally used (generally in veneer form) for the decorative surfaces of office desks and interior flush doors. It is that very striking, ‘stripy’ timber that can be seen everywhere, in buildings that were designed or fitted out from the early 1970s, up to more or less the start of the twenty-first century. (Just at the moment, there is more of a fashion for paler timbers, such as maple or beech, but sapele is still holding its own.) Sapele is yet another of those timbers from West Africa which have been popular in the UK for a very long time with users of hardwoods, especially in the furniture and joinery industries. As you might infer from its scientific name, the tree has a very parallel and cylindrical trunk; with very little taper to it and it can grow up to 60 metres high. That means any individual tree can produce a very large quantity of really high-quality timber – especially as veneers.

Its heartwood is a very pleasing red-brown colour, with that very marked interlocked grain which, when quarter-sawn, gives it the very strong ‘stripe’ figure which is, so to speak, the ‘trade-mark’ of sapele. Its density varies from 560–690 kg/m³ when air-dried and it is quite reasonably strong, although that point is academic, since the timber is never used for structural purposes.

It is rated as durable, which makes it entirely suitable for exterior joinery without preservative treatment; but there is a slight issue which has more recently come to light, in that sapele can sometimes exude a reddish-coloured material, which can show through on painted surfaces, so care must be taken in specifying an appropriate finish, if an opaque coating is to be used.

Sapele is now readily available as a FSC-certificated timber in the UK, which is probably just as well, considering its enduring popularity; and which should ensure its continued use for as long as its sustainability credentials remain valid.

7.1.39 *Tatajuba* (*Bagassa guianensis*)

This lesser-known timber comes from northern South America; and – as you may have realised – it is one of the newer timbers to come onto the UK market (although it has been known about for at least the past 40 years!). It is distantly related to iroko – though of course, that timber comes from West Africa, whereas tatajuba is from a completely different continent. However, tatajuba is somewhat similar to iroko, both in its appearance and in its end uses; although tatajuba can be a bit heavier than iroko, averaging around 830 kg/m³ when air-dried. The heartwood of tatajuba is orange-brown in colour when it is freshly-sawn, but darkening on exposure to UV light to a much more mid-brown colour (once again, not unlike what happens with iroko); and its overall texture is quite coarse. It is rated as medium in its movement characteristics; and it is rated as very durable; so it is a very good timber for most outdoor uses, without the need for any preservative treatment.

The primary use for tatajuba in the UK to date has been for decking, as seems to be the case with so many of the ‘newer’ South American timbers.

There are supplies of FSC-certified tatajuba available in the UK, but so far it has only been brought in as external decking profiles, and not as a ‘general use’ timber – which, given its excellent technical properties, seems a pity.

7.1.40 *Teak* (*Tectona grandis*)

Teak is an extremely well-known timber, which has been used in the UK for well over a hundred years; and it was also hugely popular in the 1960s and 1970s as a furniture wood, though it now seems to be staging a bit of a fashion comeback – especially when used as benches and garden furniture.

Although it is actually native to Thailand, Java and (more especially, from a historical UK point of view) Burma, we don't see very much of the indigenous timber here in the UK. Practically all of what we get nowadays has come from one of the many extensive plantations around the tropics: particularly from certain South American countries, such as Bolivia.

It is an attractive, golden brown timber, with darker streaks and an attractive figure; and with a moderately coarse texture. Its density is about 650 kg/m^3 when air-dried and its grain is commonly very straight. It is rated as very durable and it also has small movement characteristics; both of which properties make it ideal for external joinery and for garden furniture. Its chief characteristic feature is its natural oil, which migrates onto its planed surfaces quite rapidly, thus giving it a 'greasy' feel, but of course, it is also this natural oiliness which helps it to remain weather-resistant.

Although the UK has recently restored trading links with Burma (Myanmar), there are no certified supplies of teak coming from there as yet. However, it is available as fully FSC-Certified material from plantation stocks being grown in Bolivia and elsewhere.

7.1.41 *Tali: See Missanda*

7.1.42 *Tiama: See Gedu nohor*

7.1.43 *Tulipwod: See whitewood, American (that is in this chapter, under hardwoods, it is not 'whitewood' the softwood!)*

7.1.44 *Utile (Entandrophragma utile)*

If you have a look at its scientific name, you'll see that utile is very closely related to sapele, and also to Gedu nohor: and it does in fact come from exactly the same part of the world as those two timbers. (As an aside, I would like to emphasise that its name is pronounced 'You-tilly' and *not* 'You-tile' – as though it should be used on a roof.) Utile is an attractive red-brown wood, with a tendency to have slight interlocked grain – although not anywhere as strongly as sapele does. Perhaps for this reason, utile is more often seen in the solid form, rather than as veneer, which is the way we most often see sapele. But utile is a little heavier than sapele, averaging somewhere around 670 kg/m^3 when air-dried and it is slightly coarser in

texture. Its heartwood is rated as durable, which also makes it suitable for external joinery without preservative treatment.

Just as with sapele, supplies of FSC-certified utile can now be obtained from West Africa via a number of UK importers.

7.1.45 Walnut, American (*Juglans nigra*)

The second part of the scientific name for this timber – ‘nigra’ – rather gives away its other common name of ‘black walnut’; and indeed, the UK timber trade often refer to it as ‘American black walnut’. It grows as a moderate-sized tree, about 30 metres in height and it can reach up to 1.8 metres in diameter, although many commercial trees are not that large. It is found on the eastern side of the USA and just a little way up into parts of eastern Canada.

As a timber, it is quite hard and dense, being about 640kg/m³ when air-dried; and its heartwood is very dark brown in colour, with the overall colour tone deepening with age. The very pale sapwood is clearly demarcated from the dark and decorative heartwood, but since it is quite a small tree, the sapwood is not usually excluded from the graded boards in commercial shipments of this timber. (It is very often sold in a quality that is described as ‘sap no defect’, where the word ‘sap’ of course really means ‘sapwood’, not the tree’s own juices!).

It is rated as very durable, although American walnut is another of those timbers whose rather high price and highly specialised uses mean that this particular property of the timber is unlikely to be tested very much. As you may be aware, its main uses are for very high quality furniture and the stocks of extraordinarily expensive shotguns, although I have also seen some very large and impressive joinery and panelling projects which have used it – with very striking results.

It can be made available as certified material via the American SFI scheme, though once again, any UK stocks from this source will have been ‘badged’ as PEFC so far as that Chain of Custody is concerned. But it is also available from other importers directly as FSC-certified timber.

7.1.46 Walnut, European (*Juglans regia*)

You can see from the name of the genus that the European and American timbers are very close relatives; and they have quite a similarity in texture and character, although the English and

French supplies of walnut are usually not so dark in colour as the American sort. In terms of both density and strength, the European timber is much the same as the American walnut; but its heartwood is only rated as moderately durable (although again, that is unlikely to prove much of a difficulty in actual use).

As with its American cousin, its preferred uses are in furniture (though more often in veneer form) and as gun stocks. Speaking of 'stocks' (if you'll pardon the pun) not very much of the walnut in use in the UK comes from England these days: most supplies of European walnut come to us from France or Italy.

Some limited supplies of European walnut are available as FSC-certified stock from European sources.

7.1.47 Whitewood, American, or tulipwood (*Liriodendron tulipifera*)

This is one of those timbers with very many different trade names: and it is even called 'yellow poplar' – although as you may tell from its scientific name, it is not at all related to that particular wood. Furthermore, to call it by the name 'whitewood' can be doubly misleading, from a UK perspective, since that is what we more often call European spruce, of course (see the earlier section in this chapter, on softwoods). So I much prefer to refer to this timber as 'tulipwood' to avoid any misunderstandings.

Tulipwood is a very workable, all-purpose furniture and joinery timber, that is wonderfully easy to use; and which takes stains and glues extremely well, which is why it is so highly regarded in those sorts of decorative use. As a tree, it grows in the eastern USA, where it can get up to 30 metres high and 2.5 metres wide. Its density is really quite moderate – only around 500kg/m³ when it is air-dried – and its heartwood is yellowish or olive-brown in colour; whilst its sapwood is very pale and almost pure white. It is rated as only slightly durable; but since it is practically never used for exterior purposes, that doesn't really affect its popularity, although it is something to consider, if you should ever decide that you want to use it out of doors.

The wood itself is very soft and is really easily worked; so it is very popular for making interior joinery and for shopfitting; and also for carved items. And because it takes wood stains so well, you could easily come across it 'disguised' as another timber, when it has been dyed a darker or perhaps a redder

shade and therefore you might not recognise it as being tulipwood at all.

And, since tulipwood is a very commonly available North American hardwood, it can also be certified under the SFI scheme, in respect of its Chain of Custody credentials, so it may sometimes be seen as a PEFC-certified timber here in the UK. But then also, as with quite a few other North American timbers, it is available via other imported sources as fully FSC-certified material.

8

Re-use of Timber and Wood Products: The Carbon Cycle, End of Life Disposal and Biomass

It is pretty well appreciated nowadays that trees are extremely good for us, so far as our atmosphere is concerned. And it has of course been known for a long time that forests can produce large quantities of oxygen and that they also absorb very large amounts of carbon dioxide. At least, that is the popular view and it is more or less correct – but only up to a certain point. After the individual trees in the forests – not the forests themselves – have been growing for a long period of time, that ‘accepted wisdom’ of the oxygen/CO₂ balance doesn’t necessarily hold true.

Trees will only carry on ‘converting’ CO₂ and water into oxygen for us to use (and along the way of course, storing up the resulting and residual carbon) if they can also continue to manufacture more and more of their own wood tissue from the cellulose and other natural substances which result from this reaction, because that is the only method by which that wonderfully helpful ‘carbon sequestration’ chemical process can take place. What many people often do not grasp is that it is simply not possible for any tree to store up more carbon, if it cannot at the same time make more cellulose; since it is only from that special combination of CO₂ and H₂O that cellulose is able to be made. And then from that continuous manufacturing process, all of the ‘spare’ O₂ is then able to be released into the earth’s atmosphere. So it is a fact that trees can only make cellulose whilst they are still actively *growing*.

All of the foregoing means that fully *mature* trees – that is, trees which are no longer actively growing and actually

expanding – do not, and *cannot* make cellulose and so they will no longer take in ‘harmful’ CO₂ from our atmosphere and give out ‘useful’ oxygen as a by-product. Instead, they just simply ‘live’ – in more or less the same way that we do and by the same process of ‘breathing’ in oxygen and then giving back CO₂ to the atmosphere. Just like all of the other air-breathing, living organisms that co-exist with us on this planet. Having told you all of that, I hope from now, you will recognise that a slavish insistence on *all* trees – no matter what they are – being allowed to live as long as they want to, just because they are ‘old’ and have been with us for a long time, is quite nonsensical and of course, it is not at all helpful to us humans.

Conversely, a properly-managed approach to *deliberately* cutting down a lot of our trees at some point in their lives – and at a point well before they have reached ‘maturity’ (whatever that particular term may mean, depending upon the individual type of tree species) is not only the morally ‘right’ thing to do, it is absolutely, in my view, the *essential* thing to do, if we are to help ourselves and our planet to thrive. And I don’t apologise one iota for playing what appears to be an ‘environmentalist’ card here. In my opinion (and it is, I admit, purely my own opinion), there are too many people who think of themselves as ‘environmentalists’, who worry more about saving trees – and also about a lot of the reported incidences of so-called ‘illegal logging’ – than they do about saving the actual environment itself. Or at any rate, it would appear to me that they think that the policy of cutting down trees and the taboo of ‘harming the environment’ both amount to much the same thing. And yet, as you can see from what I have just outlined above, about the way in which ‘carbon sequestration’ actually needs to work in practice, that particular ‘environmentalist’ argument – of ‘saving’ all of the trees, no matter what – does not hold water (or rather, carbon!) in reality.

8.1 The true ‘carbon cycle’

I have used the phrase ‘carbon sequestration’ a couple of times now, but perhaps I have not fully explained what I mean by that second word. The way in which trees convert CO₂ and water to wood (which is primarily, though not entirely, cellulose), and then just happen to end up giving out oxygen as their ‘accidental’ by-product, means that all of the atmospheric carbon which they have absorbed during this process has been effectively ‘captured’ or ‘imprisoned’ within each and every one of the

cells that comprise the wood substance within any tree, anywhere on this planet. So that, then, is what 'sequestration' means, to take away, and keep out of the way, either for good – or certainly for a very long time. (For example, criminals nowadays often have their ill-gotten gains 'sequestered', after they have been convicted, so that they may no longer have the benefit of them, after they have served their sentences).

After they have made all of their new wood cells, all of that 'sequestered' atmospheric carbon will then remain stored within the wood of the tree; and of course, it stays there as long as that tree is still growing and alive. But also, it remains 'locked up', after the tree has been harvested, for as long as its timber is then used to make something with. And so that 'sequestered' carbon can stay 'locked up' for years and years; for long after the tree was last alive and growing in the forest, right up until its timber is finally broken down again by some other process (as we shall see in a while).

But the sequestration of CO_2 from out of our atmosphere by trees, is really only the very beginning of the story of the entire 'carbon cycle'. There is much more to the whole idea of a 'proper' or 'complete' carbon cycle than just the basic chemical processes that are involved in making wood tissue and then – completely incidentally, so far as the trees are concerned – giving out the very gas that we all need in order to breathe and

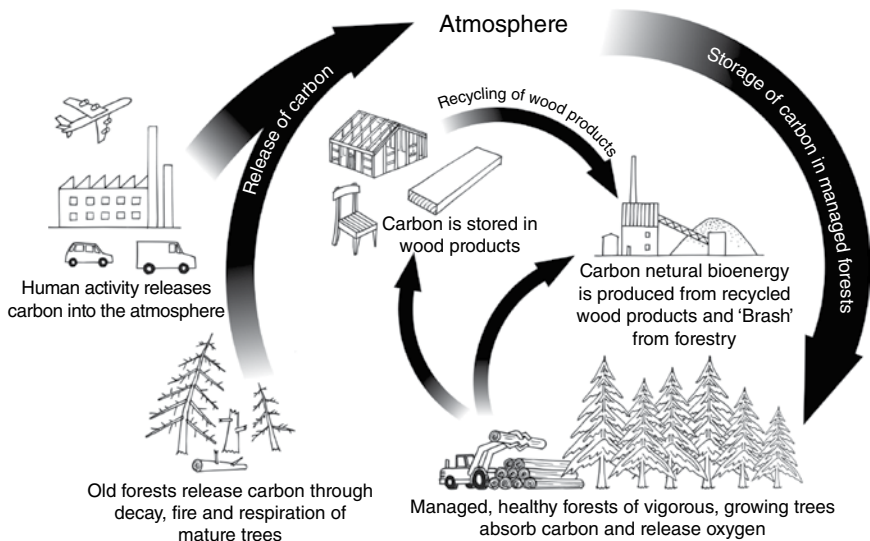


Figure 8.1 The 'carbon cycle' – which makes wood carbon neutral.

to stay alive. If we can imagine the whole process as a 'wheel', then the complete rotation of that carbon cycle can only be fully understood, if we go on to see how, after the carbon is 'mopped up' by our trees in the first place, they then hold onto it within their timber. And then what happens to it when the wood has ceased its function and is recycled in some way.

So, in fact, it is really quite important to know just how long the trees may keep their carbon locked up for. And then finally, when we get to the end of the entire carbon cycle (or the full 'turn of the wheel', as one might say), we will need to consider just exactly how, when and where all of that 'locked up' carbon may be released back into the environment.

8.2 End of life disposal of timber and wood-based products

Assuming, then, that we have actually cut down our trees before they have finally reached maturity (which is absolutely the right thing to do with them); and that we have then used them to build houses, or to construct furniture, or to make grand pianos or whatever, we will – eventually – need to think about what happens to their carbon content, when we no longer wish to still use any of those things that we have made from their lovely wood. Of course, we might just simply 'recycle' that wood, by making something else out of the 'old' timber and that of course is a highly laudable aim, but it is not always possible or practicable. But perhaps we may instead just send that timber to landfill – rather like we do with so much else of our waste materials. Or maybe we might burn it, of which, more later.

8.3 Recycled timber

I have already stated in an earlier chapter, that the use of any recycled timber or wood-based products for any new project will immediately remove the obligation to source that project's timber in any other 'sustainable' way, so far as the government's guidelines are concerned. And so there will be no need for any Chain of Custody Certification or any due diligence files full of EUTR-type paper-trail; if the wood being used has already been used at least once before in its lifetime. And of course, while all of that 'old' timber is still being kept in service,

so to speak, by being used all over again; then all of its 'locked up' carbon remains exactly that: locked up and put away for many more years, before it is finally released into our atmosphere.

Recycling of timber is rather in its infancy at present, although it is advancing more rapidly, as every year passes. The overall concept is not new of course, 'architectural salvage' of old beams and the like has been going on for generations, usually under the title of 'reclaimed wood'. But the more general uptake of 'recycling' in its full, modern sense – so far as timber is concerned – has been quite slow; and there are still problems with getting the re-use of timber to be accepted on a wider scale. Not the least of these issues is the question of what actual wood species it is, and whether or not it still has any useful 'life' left in it, beyond its present – now finished – use.

However, these are fairly minor considerations in the scheme of things; and they can be resolved with a little more understanding about wood as a material and its technical attributes and requirements. (And of course, all you need for that is a wood scientist to help you!)

8.4 Disposal of timber in landfill

In past times (not so very long ago, really, if we stop to think about it) it was a very common sight to see skips full of old timber from demolished buildings, just waiting to be taken to the tip. I'm not saying that that sort of scenario doesn't happen anymore: just that it is far less common a sight than it used to be, a decade or two ago. However, it has become more and more well understood in recent years that there are two – or perhaps even three – 'problems' with the whole idea of just putting wood into a landfill site.

First of all, timber is quite bulky stuff, in comparison to its weight and so any given amount of 'waste' wood will always fill up more of the available landfill space than its equivalent weight of some other building material, such as rubble or hardcore. Secondly, as the wood decomposes, it then gives off its 'locked up' carbon in the form of gas, sometimes as CO₂ but more often – when it has been buried for a time underground – as methane, which (as you may have heard about elsewhere) is reckoned to be a much more harmful greenhouse gas than carbon dioxide ever could be. But, hang on a bit, before you rush to condemn wood for its methane-producing qualities.



Figure 8.2 This item of furniture has been made from reclaimed wood.

The picture in relation to the emission of greenhouse gases is not actually so very serious, where wood is concerned, as I shall explain shortly. But even so, it is still not a good idea to have tons of methane coming up out of the ground, because that way, serious gas explosions can – and do – occur. So when we – perhaps rather thoughtlessly these days – put our wood waste into landfill, thus effectively taking the ‘easy option’, we could find that we then create problems which are unnecessary and avoidable, had we done something else with it, such as re-use it for some other purpose. But that approach then requires additional commitment; and very probably additional time and effort as well. So maybe instead of re-using it or simply burying it, we could burn it, which now brings me to the consideration of that whole issue.

8.5 Burning wood: Fossil fuels versus biomass

These days – and for some time now – we keep on hearing a lot about ‘fossil fuels’ and their adverse impact on our environment, by dint of their releasing greenhouse gases into our atmosphere. ‘Well then,’ I hear you say: ‘What about the fact

that timber gives off CO₂ when it burns, or indeed – as you have just now told us – that it gives off highly inflammable methane, which is another greenhouse gas, when it decomposes? So isn't the use of wood as a fuel just as harmful to our planet as burning oil or coal is supposed to be?' That's a very good question and it is one which I am now very happy to answer in some detail.

A 'fossil fuel' essentially is exactly what it says: a type of fuel that was laid down in our earth's crust at the time when some of the fossils were also created, millions and millions of years ago. (In many ways, it doesn't really matter exactly when those fossil fuels were laid down, the important fact to bear in mind is that it was long, long before mankind came along. And long before he eventually started to extract those fuels out of the ground and used them to 'power' our modern civilisation as we know it.) But, as it happens, the exact geological period when oil and coal were deposited within the earth's crust has a rather tell-tale name, so far as our particular 'take' on the environment is concerned: it was the 'carboniferous' period – which was around 350 million years ago. So it should be pretty obvious, from the name of the period, that those two fossil fuels (coal and oil) must have 'locked up' or 'sequestered' between them a really, really, huge quantity of carbon from out of the earth's then atmosphere, all of those millions of years in the past. And in fact, that was more or less the mechanism by which we got to have so much oxygen in our atmosphere as we do now. It was not nearly so oxygen-rich, prior to the carboniferous period, as it became – and remained – afterwards.

But the point which I am wanting to make here is that the carbon which is now being released back into our present-day atmosphere from burning that 'prehistoric' coal or oil, is being added as an 'extra' burden of greenhouse gas that was not there before (or at least, it was not in our atmosphere at any previous time when *we* were there on the earth!). So this effectively 'new' lot of carbon which is being discharged from fossil fuels, is therefore changing – and of course, it is actually increasing – the proportion of CO₂ that now exists in our present-day atmosphere, and that is why those 'fossil fuels' are now considered to be so harmful to the environment that we live in.

However, as far as wood as a fuel is concerned, any of its carbon that is now being released as a result of its breakdown in landfill, or from the burning of it as biomass, is in fact only putting back into our atmosphere the same atoms of carbon that

the trees themselves took in, during their very recent lifetimes. (When I say 'recent'; I mean recent in geological terms; not necessarily in relation to our own brief lifetimes.) But even when we are burying or burning some timber that may have originated from the disposal of the occasional one-thousand-year-old Californian redwood (a great pity though that would be); that is as nothing, in terms of its timescale, as compared to the burning of some 350-million-year-old coal! And of course, the vast majority of any of this end-of-life timber which is now being either decayed or burnt, is in reality much, much younger than a thousand years: it is normally a handful of decades, at most (or even shorter, if we think of the millions of disposable pallets on our roads and in our storage yards, which are lucky to last more than two or three years). So we can reckon the 'service life' of most reclaimed timber that ends up being used as fuel, in a few tens – or at the very most, a couple of hundred – years, which is very very 'recent' so far as our planet is concerned.

And that is why – at the end of the timber's day, so to speak – wood is regarded as being a 'carbon neutral' material, because all of the carbon which it finally returns to our atmosphere, when we've done with it, is to all intents and purposes 'current' carbon; so it simply does not add any more to the atmosphere than was taken out of it, a relatively short time ago.

8.6 Biomass

The word 'biomass' is one which has not yet achieved common currency amongst the population as a whole. Of course, the 'greens' know about it, as do those who are concerned with the relatively new industry of generating heat and/or electricity from burning forest thinnings and wood residues. (As a quick aside: when I was first involved with the timber trade back in the early 1970s – indeed, probably right up until the late 1990s – there was no such thing as 'wood residue'; it was all called 'wood waste', and mills often had to pay someone to take it away. But now, those sawmills and other wood processors happily sell their 'wood residues' to one of two competing industries and the biomass-using wood-burners are one of those two industries who are now in competition with one another. The other one of course, is the panel products industry: who had, until relatively recently, been taking the vast majority of 'wood residues' and forest thinnings to be chipped or ground up, to be made into wood particle-board, hardboard or MDF.)



Figure 8.3 Biomass ready for the furnace in a power plant. Image provided by <http://bbn74energyproduction.wikispaces.com/Biomass+Power> and licensed under the terms of Creative Commons, <http://creativecommons.org/licenses/by-sa/3.0/legalcode>.

Biomass should not, however, be confused with the term 'biofuel'. The latter is the name given to (usually) diesel which has been made from recycled chip fat, or some such; and which some people use to power their cars and vans with. Biomass is the 'proper' term that is now used for any form of plant-derived material which is then incinerated to generate heat or power, or both. And its use is both quite sophisticated, and also rapidly increasing. Already in the UK there are a number of power stations which can burn biomass to generate electricity; either by being entirely dependent upon it, or by having the capacity to switch to it on occasion, in order to keep from burning more gas or coal. And there are a few (usually government- or council-run) 'CHP' schemes – which stands for 'combined heat and power' – which burn biomass and then use the heat thus generated to directly heat local housing, or other similar accommodation, such as barracks for troops: as well as providing the electricity needed by that same development. And these CHP schemes can be not only cheap or cost-effective, they can even be profitable, with any surplus capacity being sold on to the national grid.

There is, however, a fly in the ointment – as I hinted at, in my 'aside' in an earlier paragraph. For the past few years, there has been a sort of simmering 'trade war' between the 'traditional' users of wood residues (i.e., biomass) who have, for a long time, manufactured wood-based boards out of them, and the new 'upstarts' – the 'biomass industry' – who only want to



Figure 8.4 'Biomass' is now transported across the UK. Reproduced by permission of Stobart Group Lorry.

burn those residues. The 'old guard' (if you will) have been crying 'foul' because the UK's government has been paying a subsidy (technically called a 'feed-in tariff') to those biomass generators, in order to encourage them to invest in generating more and more 'green' electricity from this wonderful carbon-neutral fuel of ours: wood. And that government subsidy has enabled the biomass generators to offer – and to pay – a higher price for their supplies of wood residues; which in turn has put up the price that the board producers must pay for their raw materials. But, market forces being what they are, the forest owners and the sawmills would be rather silly not to accept the best price that is now on offer, for something which they almost had to give away – or even had to pay to get it disposed of – only a few years ago.

There is one bright spot on the horizon which has come out of this 'waste wood war' as I might call it and that is the fact that almost *all* forest thinnings (that is, the smaller diameter trees that are not considered fit to grow on to a harvestable size) and 'brash' (which is the term given to all the branches and other bits that are cut off the trees, as they are being harvested) now command a decent price; which then makes it worth the trouble of managing any forest much better than was the case in the past. The demand for biomass is, in effect, acting as a spur to better forestry practices and it is encouraging an altogether better way of looking after many of the smaller areas of woodland in this country that were too often neglected in

the past, because they were not considered to be economic to manage, as commercial forestry operations. Yet now, there is a value to anything which can be brought out of those woodlands, even if the resultant material is not good enough to use as timber for any other end uses. It can always be incinerated!

The same sort of thing is true for much of the timber which is not yet considered to be 'good enough' for recycling into other projects – be they for building, furniture, or whatever. Now, instead of that 'old' timber just being put into landfill, more and more of it is being chipped up; but not for making into chipboard, instead, it is being mixed in with 'virgin' forest material and sawmill residues; and it is now being used to help run the turbines in those electricity-generating biomass power stations. So in this way, the use of biomass is also reducing the pressures on landfill as well, which surely has to be a good thing. And the even better thing about using 'waste' wood in this way is that it is effectively 'free' energy – and it is also 'carbon free' (Oh well, all right, 'carbon neutral') as well.

9

Energy Considerations and Construction Materials

This whole subject is a very contentious one, and it can certainly raise the temperature of any debate about which materials should be used in ‘environmentally friendly’ construction projects. So let me say, right at the start of this chapter, that all of the views expressed here are entirely my own; and you can very probably find some contrary or conflicting views out there, if you do your own search on the internet. However, I would caution you to look into the background and credentials of whoever may be expressing any of those views; and then ask yourself how independent or unbiased they might be, when expressing their opinions. (I will admit that I am certainly ‘biased’ in favour of using wood: but at least I am an independent consultant and I am not being paid by any vested financial interests to ‘plug’ any particular argument for a specific material, or to knock down any arguments that may be used to praise some of those others.)

Along the way towards writing this book, I have undertaken a considerable amount of research into the whole area of what is understood by the term ‘embodied energy’ and how that concept can influence the selection of a particular material for a particular job. And if I have learned one thing above all else, it is that there is absolutely *no* form of universal agreement on anything to do with energy inputs; or carbon sequestration; or indeed, the basis for the calculation of any figures surrounding those issues. And so this final chapter of the book has to be – of necessity – very much my own ‘take’ on what I have seen,

heard or read on the whole subject of energy in construction materials, and how it is assessed.

9.1 Embodied energy

I had better start by clarifying what I believe is meant by this phrase. In its most basic sense, it refers to the total amount of energy input that has been required or used, to get a construction material (or in fact, anything else, for that matter) to the state where it can be used for some particular purpose. And by its 'energy input' I mean the total amount of fuel – whether that is oil, coal, gas, electricity or whatever – which had to be expended (usually burned), so that the material in question could first of all be extracted – that is, mined from out of the ground, dug out from a quarry, pumped up from the depths of the earth, harvested out of forests, etc. – and then subsequently processed – that is, crushed, refined, smelted, fired, machined and so on – before it was in a state where it could actually be used to make something with, as a basic 'raw' ingredient. And, as far as I can see, that basic idea of the 'total energy needed for manufacture' holds equally true for



Figure 9.1 Timber, brick and concrete – wood is calculated as having the lowest 'embodied energy' of any common building material.

steel, aluminium, bricks, 'breeze' blocks, timber, PVC, or anything else that we might select from time to time, to make a completed building out of.

But, therein lies the first of many areas of potential disagreement: the compilation of 'meaningful' figures on which to base comparisons, or – very often – arguments, from one material 'lobby' or another. First of all, just exactly *how* do you measure the overall 'energy' that was used? How can you sensibly, and in a fair and equal way, compare (say) coal or gas with electricity or steam, for example? (There are ways in which this has been attempted, but I do not propose to go into any great detail here.) And what about the energy that has been derived from such things as recycled timber – especially if that is then 'put back' into the production process? How does that 're-used' energy fit onto an equation which may have been based primarily on the use of 'virgin' energy, such as that coming from fossil fuels? And then, even if you have found a way to create such a (perhaps utopian?) 'level playing field' on which to compare all of your sources of energy; how can you measure *precisely* the input for each and every one of the processes which have to be included, just to be able to make that material? No wonder you can find a different answer, more or less each time you look for any results along those lines, depending upon exactly how you ask the question!

And then – just supposing that every obstacle in the way of equal or 'fair' measurement (or at least, some form of fully-agreed 'equivalence') has been surmounted – how far along the road towards the 'completion' of the production process do you take your measurements and how far *back* along that route do you need to go, so as to be 'fair' to each camp? Do you look at just the steps from the quarry to the factory? Do you go only from the forest to the sawmill? Or from the mine to the smelter? Or should you go all the way to the warehouse or the builders merchant's yard? And even then, what about the costs of transportation of those different materials at the different stages in their 'production cycle'? And how valid – or indeed how vital – is their proximity to where they are 'produced', relative to where they naturally occur? In other words, is it better to have your steelworks next to a coalfield (as used to happen in this country in the past)? Or is it better to transport your logs from the jungles of Africa or Brazil to (say) Amsterdam, before you cut them up into boards – most probably more efficiently than you could in the jungle – and



Figure 9.2 Logs brought from forest to sawmill have a very low energy input.



Figure 9.3 Cement has a much higher level of energy input before it gets to site.

then maybe ship them onward to England? I hope you can now begin to see the difficulty of making *any* sort of meaningful comparisons, which cannot be challenged by *someone* with or without an axe to grind.

So, after a few years – and after more than a few tries at getting it ‘right’ – various people began to realise that something better than just a somewhat simplistic ‘energy input’ of material manufacture was needed.

9.2 Cradle to grave analysis

This rather odd-sounding term is one that has grown up over the years, in response to the view that it was no longer good enough – nor was it very fair on the various materials being examined, as I have sought to outline above – to assess any of those materials solely on the basis of the energy that it took to produce them from scratch. Yet that former, and rather more simple approach, was for quite a long time, the only fully ‘accepted’ way of looking at the so-called ‘energy cost’ of any construction material. And, as I have said, it sought to measure nothing more than its ‘embodied energy’, however flawed that method might now seem to have been, to later observers and researchers. However, that over-simple approach still continues to be used in the compilation of some figures; and that is one reason why there are so many conflicting views as to which material is considered to be the ‘best’ or the ‘greenest’, since the whole thing rather depends upon exactly what you’re measuring and who is doing the measurement!

If you look just at the amount of energy it takes to smelt ores into steel or aluminium, or to ‘fire’ clay into bricks, or to cut down trees and process them into timber in a sawmill, then you will end up with widely differing figures. And – allowing also for the energy used in their transportation at different phases of their production – wood will generally come out a long way ahead of those other main construction materials, in terms of pure ‘energy input’ or apparent ‘energy cost’. Maybe that is one of the reasons why certain of the ‘competing’ materials (from wood’s point of view, that is) began to look at other ways of comparing how much energy it *really* took to be able to use a material; if you examined not only its basic production, but if you looked much harder into *everything* that occurs in the overall ‘life’ of that material.

And so, in the years in which these various debates as to the merits or shortcomings of any one methodology have been raging, it has become more and more apparent that the entire ‘life cycle’ of a material should be examined. Or perhaps we should more properly say, the life cycle of a specific product – such as a window, or even a whole house – rather than just its ‘raw material’ should be examined closely, in order that we can get a much fairer basis for comparison. Hence the concept of ‘cradle to grave’ analysis, where every single energy input possible, for every stage in the use of a material – and of the products eventually made from it – is measured and assessed,

and then finally added up. Such a concept is also referred to as 'Life Cycle Analysis' or LCA.

But the overall measurement of a material's 'energy balance' doesn't just stop there, with the adding-up of *inputs*, because every energy *saving* is also calculated, and then deducted from the total of inputs, so as to give a final 'lifetime' figure. And by 'saving' energy, I mean things like the recycling of aluminium cans and such; which then 'saves' the much more considerable energy costs of mining new ores. Or the burning of wood residues (in sawmills, to generate electricity or to 'fire' the drying kilns, for example) so as to 'offset' the total energy used in the production of timber. Therefore, any and all use (and re-use) of residues – including 'scrap', 'waste' or 'reclaimed' material – has to be looked at; and its 'negative energy figure' must then be assessed and finally subtracted from the total of the energy used in the production of the material under consideration, to reach a 'fair' result. And you can just imagine how much across-the-board agreement there is to those figures – as issued from the various different 'camps' – or even as may be calculated by different researchers, even from those who do not have an obvious axe to grind!

However, for all its flaws, there is at least a pretty good general agreement to the *principle* that a full calculation of *everything* is the right way to be heading, if we are to have any chance of making what can be regarded as 'fair' comparisons. And so 'cradle-to-grave' assessments are considered to be much better than just basic 'embodied energy' calculations. But – once again – there are those who are not satisfied with what they see as a simple 'life cycle analysis' or a 'cradle to grave' assessment of any given material. They want to see its use set in the much wider context of the health and well-being of the whole planet!

9.3 Cradle to cradle

This term is even more odd-sounding than the last one. Having decided a while ago that cradle to grave (or LCA) was a much better approach, it then began to be thought that what you did with the materials *as a whole* was a much better way of looking at them, from a 'sustainability' point of view. And so people began examining what was done with the waste products and even the 'spare' energy resulting from producing and then using any material. And so the desire grew up to see whether,

for example, a building could be made *and then used* without generating any – or at least, minimal – waste throughout its entire lifetime. Hence the phrase (and I personally think this is a rather odd term) ‘cradle to cradle’, with the notion of going back to where everything started from. But perhaps a better term (to me at least) is one which is a lot more recent in my own experience, but which means exactly the same thing as cradle to cradle, and that is ‘the circular environment’.

This latest way of examining every aspect of a material’s use, within a ‘holistic’ context, is much more the type of approach which is used in all of the more modern assessments of our attempts at ‘green’ energy uses in the built environment. And it is the basis for the radical approach to building assessments that is known as ‘BREEAM’, and which I shall now use as my example.

9.4 BREEAM

This set of initials stands for ‘BRE Environmental Assessment Method’ (BRE is the acronym of the former ‘Building Research Establishment’, which was government-owned until its privatisation at the end of the 1990s). The objective of BREEAM is to promote the benefits of having a complete awareness of sustainability in all its aspects, in relation to buildings. As well as awarding a ‘score’ for the building in question, BREEAM helps all of those involved in the building process to understand and adopt sustainable solutions to practical building requirements; and by awarding a rating for ‘success’ along the road to achieving a fully sustainable building, it helps to raise awareness in the marketplace as to what can be done and what *is* being done. Buildings are scored as ‘Pass’, ‘Good’, ‘Very Good’, ‘Excellent’ or ‘Outstanding’ – depending upon how many criteria they have adopted and incorporated into the building process, but not just into the building itself.

Perhaps surprisingly, BREEAM has quite a long history, and in fact, it is by far the oldest – and also the most widely used – assessment and rating method for buildings in the world. It began as an idea at the then government-run BRE in about 1988, before being fully launched in its first version in 1990, at which time, it was initially used to rate new office buildings. Over the next few years, its scope was extended to cover other types of new-build: including major supermarket developments (so-called ‘superstores’), industrial units (on trading

estates and the like) and eventually, existing office buildings – in order to see how they compared to an ‘ideal’ energy-use situation. About a decade after it was first thought of – and therefore just before the new millennium – BREEAM was more or less completely re-structured and its ‘rating’ criteria were overhauled, to include a form of ‘weighting’ to the basic points system that had been used before. This allowed assessments to be ‘uprated’ by factoring in additional allowances for better, or certainly more modern, energy-saving or energy-use methods and materials, in order to be able to assess the overall concept of full ‘sustainability’ more effectively and also more fairly. So, having become fully-fledged and – by now – well established and recognised, BREEAM then began to be updated annually, so as to take account of new practices, new research results and new interpretations of data. And at the same time, some more building types were added to its scope.

In the year 2000 – by which date, its time had definitely arrived – the BREEAM idea was finally extended into housing, with a stand-alone version called ‘EcoHomes’. The methodology behind EcoHomes was then later used by BRE to develop the ‘Code for Sustainable Homes’, on behalf of the UK government; and this then replaced the EcoHomes Scheme in England and Wales. The development and improvement of BREEAM continued apace, and in 2008, it was launched on the international stage. Then, in 2011, ‘BREEAM New Construction’ came on the scene, as an assessment and certification system for all new buildings of any type – commercial, domestic or whatever. The next full review of BREEAM is due in 2014, so who knows where it will go next?

9.4.1 Assessment criteria

Of course, no discussion of ‘sustainable building’ would be complete without at least telling you exactly what things are being assessed. The BREEAM process looks not only at materials and building methods – vitally important though they are. For a very highly-rated building (that is, ‘excellent’ or ‘outstanding’) it must of course be extremely good in its ‘lifetime’ energy consumption, but it must also excel in other areas too. In its use of other resources, such as water (with recycling of ‘grey’ water wherever possible); in the health and well-being of the building’s users (remember ‘sick building syndrome’ in the 1980s and 1990s?); as well as minimising the pollution potential

and the transport costs of all of the building materials, both during construction and also at the end of the building's life. And most importantly, all this must be with the minimum of waste – that is, of energy, materials and so on – throughout the life of that building.

9.4.2 Timber's contribution to sustainable building

Of course there is a lot more than just a consideration of the materials themselves as used in construction, in order to end up with a really 'sustainable' building. But – and this is absolutely the case, so far as housing is concerned; though it is also very significant in other building types – it has been shown very frequently that timber can make an outstanding contribution in terms of the overall 'energy budget' of a building, at all stages of its life.

Timber is very low in energy input, since it takes significantly less energy to convert logs to boards or planks, than it does to convert ore to steel, or clay to bricks, for example. Timber is also a very good store of carbon all through its useful

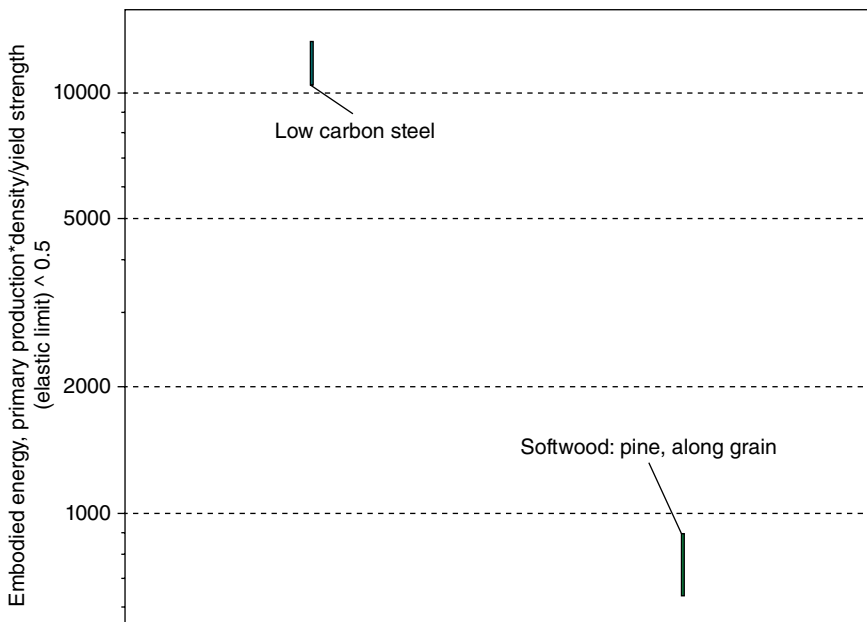


Figure 9.4 Comparison of timber's embodied energy versus that of steel, when both are used in construction Reproduced by permission of Mike Ashby and CES EduPack, from Granta Design (www.grantadesign.com).

lifetime (through the ‘sequestration’ of the CO₂ in the atmosphere which is carried out by vigorously growing trees); and at the end of its duties as a building material, it can be either recycled or – at the very end of its useful life – it may be burned as biomass, to get back lots of useful energy. (And the carbon that it eventually releases back to the atmosphere is *neutral*, unlike that from the burning of ‘fossil fuels’.)

And perhaps best of all for a building material, timber has a very good natural insulation value, that is a function of its cellular nature. Dry timber is, essentially, full of air pockets; which act in the same way as a quilt, so there is almost never a risk of ‘cold bridging’ in a timber frame building; and there is definitely no risk at all with wooden windows, which therefore do not require any complicated design details in order to prevent heat transfer.

I have neither the space nor the time to give you a complete breakdown of all of the figures on timber and other ‘competing’ materials – but in any event, that is not the purpose of this chapter, or indeed of this book. But if you should feel that you want to, you can wade through the thousands of pages about energy efficiency and energy values that are on the World Wide Web. And if you do so, you will find that timber comes out on top, most of the time, and indeed, all of the time for domestic uses, when it has been independently assessed by unbiased researchers.

I have given you most of timber’s ‘good points’ – and they are, to my mind indisputable. All I am now asking you to do is to give it a fair chance and to make sure that when you do use timber in the future, that what you specify or use is *definitely* ‘legal’ and, if possible, also ‘sustainable’. Believe me: it can be done!

9.4.3 The cost of being sustainable

Initially, energy and environmental ‘rating’ schemes such as BREEAM (outlined above) were slow to be taken up, because there was – and to some extent, there still is – a misconception that sustainable building is much more costly, both to design and to build, than ‘ordinary’ construction would be. But in fact, there are proven efficiencies which can result from better co-operation between the design team and the constructors, and the buildings themselves have proved very popular with their owners or tenants, because of their energy-saving potential and

lower overall energy-use bills, not to mention various tax incentives available from different sources, which make economic sense too.

There are studies which show increased uptakes in BREEAM-rated buildings in the City of London, as compared to 'conventional' construction, with up to 18% premiums on letting rates. And so, contrary to popular belief, designing and constructing a 'sustainable' building, whilst using the most environmentally-friendly materials (with timber coming very high on the list), is actually a very good and sound investment for the future. For our planet's future.

THE END
(Or just the beginning?)

Appendix 1 Terms, Abbreviations and Acronyms Used in This Book

BRE	The former government-owned and run 'Building Research Establishment', now simply 'BRE' – which is a private, not-for-profit organisation concerned with the built environment.
BREEAM	The 'green' energy rating scheme for buildings, as operated by BRE: which stands for 'BRE Environmental Assessment Method'
Chain of Custody	A scheme which aims to show an unbroken link (or 'chain') between all stages of timber purchase and procurement: all the way from the forest, via any importer or merchant, to the final customer.
BV	Bureau Veritas: a private sector certifier.
CITES	The 'Convention on International Trade in Endangered Species of Wild Fauna and Flora'. It publishes three different Appendices (commonly referred to as 'lists') which give the names of the species of all manner of things – birds, beasts and plants – that are in some way threatened with population reduction or even extinction; and which may be restricted in their trade around the world.
C-o-C	The usual abbreviation for 'Chain of Custody' (qv)

CPET	The Central Point of Expertise in Timber (procurement). A body funded by DEFRA (qv) to give advice and opinions on what may or may not be 'sustainable' and/or legal in timber specifications and purchases.
CPI	The Corruption Perceptions Index, published by the website Transparency International. It is an annual review of countries around the world, which gives an opinion on how 'trustworthy' their governments are likely to be, in terms of licensing exports and issuing valid and traceable licences and other documentation.
CSA	The Canadian Standards Association: but in this context, the Forest Certification Scheme as run by the CSA, to prove Chain of Custody from Canadian forests (it is verified in the UK by PEFC).
DEFRA	The government's Department of the Environment, Food and Rural Affairs (primarily the former Ministry of Agriculture, Fisheries and Food). It is responsible – amongst other things – for overseeing the workings of the EUTR (qv) within the UK, via the NMO (qv).
Due Diligence	Proof (by means of a documented system) that all reasonable steps have been taken by the 'first placer' (qv) of any wood-derived products onto the market within the EU, to ensure that all such products have been legally obtained from their source(s).
ETTF	The European Timber Trade Federation (not to be confused with the TTF: which is the UK's own 'domestic' Timber Trade Federation).
EUTR	The European Union Timber Regulation: which came into force on 3 March 2013; and which prohibits the importation or sale of any illegally-sourced timber or wood-derived products within the EU.
First Placer (on the market)	The company or person who initially purchases, and then sells on or distributes <i>any</i> timber or wood-based products or items (including felled trees, as logs) into the EU market. This will include 'home-grown' timber in a UK context, as well as imported wood goods. An operator (qv).

FLEGT	Forest Law Enforcement Governance and Trade. An administrative arrangement set up between the EU and some other timber-exporting country's government, to prove – by means of documentation and licences – that any wood goods exported from that country have been obtained from trees that were legally felled. (This may or may not include an element of forest 'sustainability'.)
FSC	The Forest Stewardship Council. A not-for-profit organisation which runs one of the two forest certification and wood supply chain schemes that are recognised by CPET (qv) as providing credible proof of Chain of Custody of timber and wood-based products.
GFS	Global Forestry Services: a private sector certifier.
ITTO	The International Tropical Timber Organisation. A loose association of interested parties – governments, timber traders and others – who are trying to ensure that the tropical forests are used wisely <i>and</i> commercially.
LCA	Life Cycle Analysis: another term for 'Cradle to Grave' assessments of materials and products.
MO	A monitoring organisation. These are approved and recognised by the NMO (qv) to check the due diligence (qv) system of any person or company who requires one, under the EUTR (qv).
MTCC/ MTCS	The Malaysian Timber Certification Council/ Scheme. This provides validated Chain of Custody certification for timbers from certified Malaysian forests (although it is verified in the UK by PEFC).
MYTLAS	The Malaysian Timber Legality Assurance System: Malaysias's own 'addition' to the FLEGT VPA scheme, for verifying the legality of timber purchases from Peninsular Malaysia.
NEPCon	'Nature, Ecology and People Consult': a privately-run Danish organisation which – amongst other things – operates legality schemes in various parts of the world: both for governments and for private forest owners.

NMO	The National Measurement Office: a government department reporting to DEFRA (qv); tasked with enforcing the EUTR (qv) through the accreditation of independent monitoring organisations.
OLB	Origine et Légalité des Bois. A French 'legality' certification scheme operated by Bureau Veritas (qv). (Translated as the 'Timber Origin and Legality' Scheme).
Operator	The term for the 'first placer on the market' (qv) as defined under EUTR (qv).
PEFC	The Programme for the Endorsement of Forest Certification (schemes). It is a not-for-profit organisation which provides assurance of a valid Chain of Custody for its own members and for a number of other similar certification scheme bodies from around the world, in a UK context; and as recognised by CPET (qv).
RPP	The Responsible Purchasing Policy of the TTF (qv). Members of the TTF are required to complete an annual return under the RPP to show that they are ensuring legality in their timber purchases and that they have the necessary due diligence (qv) mechanisms in place.
SFI	The Sustainable Forestry Initiative. This is the USA's own Chain of Custody validation scheme, for the USA forests and their wood supply chain (it is verified in the UK by PEFC).
SGS	A private sector certifier.
SVLK	Sistem Verifikasi Legalitas Kayu: the Indonesian name for its FLEGT VPA legality scheme.
TLTV	Timber Legality & Traceability Verification: a 'legality only' certification scheme operated by SGS.
TPP	The UK government's Timber Procurement Policy. This requires all government departments to specify and use timber and 'wood-derived products' which have been both legally <i>and</i> sustainably sourced.

TTF	The Timber Trade Federation. A UK Trade Association made up mainly of agents, importers and merchants of timber and wood-based panel products (but not of joinery or furniture items). Membership is voluntary; but all members must complete the RPP (qv).
VPA	A Voluntary Partnership Agreement. This is generally part of the FLEGT (qv) system; and it is the commitment from the exporting country's government to ensure that the FLEGT licensing system is being operated correctly.

Appendix 2 Timber and Wood Products: Some Helpful Organisations

AHEC	The American Hardwood Export Council. It advises on the availability of USA hardwoods; and it can also advise on which supplies can meet the current criteria for sustainability, as well as providing information on the technical properties of those timbers.
BM TRADA	A notified body that can assist with quality certification and certification CE marking.
Canada Wood UK	The promotional body for Canadian timber exports to the UK; it can advise on matters of compliance and Chain of Custody.
Proforest	An independent forestry consultancy practice: which formerly ran CPET (qv) on behalf of DEFRA (qv).
Technology For Timber Limited	A certification body that can assist with the quality certification of all wood-based products.
TFT Woodexperts Limited	An independent consultancy practice that can help with all technical matters on wood-based products; and which can also assist with setting-up and installing any due diligence or factory production control systems for quality or compliance purposes.

Index

References to figures are given in *italics*; references to tables are given in **bold**.

- Abies alba*, 112
- African mahogany, 141
- Afrormosia, **88**
- agriculture, 35
- aji, **88**
- Albizia falcata*, 23
- alder, 6
- Amazon rainforest, 35–6
- American red oak, 145
- American walnut, 152
- American white oak, 145–6
- ash
 - American, 128–9
 - European, 129–30
- ash die-back, 130, 131
- aspen, 6
- Australia, 23
- Austria, 113
- ayan, 130–1
- azobé, 136
- Bagassa guianensis*, 150
- balsa wood, 23
- basralocus, 132–3
- beech, European, 133–4
- Betula pubescens*, 134
- bilinga *see* opepe
- biofuel, 163
- biomass, 162–3
- birch, 6, 134
- Blue gum, 23
- Bolivia, 23
- Brazil, 21, 48, 60
- Brazilian rosewood, **88**
- BREEAM, 173–4
 - assessment criteria, 174–5
- British spruce, 113
- broadleaved trees, 4
 - managed forests, 16–18
 - tropical, 17–18
 - see also* hardwoods
- building materials, non-wood,
 - 30–1, 31
- Bureau Veritas, 54
- Cachimbo, **88**
- Canada, certification schemes, 61
- carbon cycle, 156–8
- carbon dioxide, 3
- carbon sequestration, 3, 30–1, 155–6
- Castanea sativa*, 135–6
- CE marking, 82–3

- cedar, 106
 - see also* Western red cedar
- cellulose, 2–3, 156
- Central Point of Expertise in Timber *see* CPET
- certification schemes, legality, 52–4
- Chain of Custody certification, 40, 54–6, 91–2
 - branding, 97–8
 - broken, 64, 92–4
 - evaluation, 65–6
 - FSC and PEFC, 57–60
 - Malaysia, 52
 - operation, 63–4
 - other bodies, 61–2
 - other schemes, 61–2
 - third-party schemes, 62–3
 - validation, 92, 98
- Chalara fraxinea*, 130, 131
- cherry, American, 134–5
- chestnut, sweet, 135–6
- Chibougamau, 10
- Chile, 21
- CITES, 67, 83–4, 97
 - Appendix I, 84–5, **88**
 - Appendix II, 85–6, 142m, **88**
 - Appendix III, 86, **88**
 - CITES-listed timbers, 86–8, **88**
- City of London, 177
- Clarisia racemosa*, 137–8
- colour, 105–6
- combined heat and power (CHP) schemes, 163
- conifers, 4
 - geographical distribution, 6
 - managed forests, 12–16
 - plantations, 20–1
 - see also* softwoods
- Conlegno, 73
- corrosion, 119
- Corruption Perceptions Index, 44–9, **47**
 - ranking system, 45–6
- CPET, 64, 90–1
 - Category A, 68–9
 - Category B, 69–70
 - compliance assistance, 66
 - current and future suppliers, 70–1
 - restrictions on timber use, 94–5
 - role, 65–6
- CPI *see* Corruption Perceptions Index
- cradle to cradle analysis, 172–3
- cradle to grave analysis, 171–2
- CSA, 61
- cupiuba *see* kabukalli
- decay, 101
- Dicorynia* spp., 132–3
- Dipterocarpus* spp., 140–1
- Douglas fir, 116–17
- driftwood, 96
- Dryobalanops* spp., 140
- due diligence, 72, 73–4
 - definition, 73–4
 - maintenance, 79–80
 - system design, 77–9
- Dutch elm disease, 96–7
- EcoHomes, 174
- EFCA, 65
- ekki, 136
- Elliot's pine, 21, 48
- elm, 96–7
- embodied energy, 167, 168–70
- endangered species, 83–4, 83–9
- Entandrophragma angolense*, 136–7
- Entandrophragma cyclindricum*, 149–50
- Entandrophragma utile*, 151–2
- environmentalism, 31–2, 156
- ETTF, 53
- eucalyptus, 23
- European oak, 146–7
- European Parliament, 98
- European redwood, 110–12
- European Timber Trade Federation, 52–3
- European Union
 - Construction Products Regulation, 82–3
 - FLEGT, 50–1
 - timber regulation *see* EUTR

- European whitewood, 112–14
 EUTR, 52, 71–3
 applicability, 81
 first placers on market, 81–2
 eveuss, 136
- Fagus sylvatica*, 133–4
 falcata, 23–4
 feed-in tariffs, 164
 Finland, 46
 chain of custody certification, 58
 fir, 112–13
 first placers, 75, 81–2
 FLEGT, 50–1, 78, 91
 forest
 area of Europe forested, 26
 illegal logging, 33–5
 natural, 8–12
 forest clearance, 33, 34, 35
 Forest Law Enforcement,
 Governance and Trade
 see FLEGT
 Forest Stewardship Council
 (FSC), 37, 55, 57–60, 69
 PEFC and, 97–9
 fossil fuels, 160–2
Fraxinus excelsior, 129–30
Fraxinus spp., 128–9
 fungal diseases, 130
- Gavilan, 88
 gedu nohor, 136–7, 137
 Germany
 chain of custody certification, 58
 monitoring organisations,
 72–3
 standard organisations, 60
 Timber Trade Federation, 73
 whitewood, 113
- Ghana, 138
Goupia glabra, 139–40
 greenheart, 137
 growth rates, 5–6, 7–8
 conifers, 8–10
 European redwood, 111
 latitude and, 8–9
 natural forests, 8–10
 plantations, 19, 23–4
- Guariuba, 137–8
 Guatemalan fir, 88
 Guyana, 139
- hardwoods, 3–4, 125–6, 125–54
 chain of custody schemes, 61–2
 managed forests, 16–18
 tropical, 7
 UK, 125–6
- heartwood, 111
 hem-fir group, 122
 hemlock, 114–15
 Honduras mahogany, 88
- idigbo, 132, 138–9
 illegal logging, 33–5
 imports, United Kingdom, 16
 Indonesia, 23, 24, 34, 50–1, 144
 indoor timber, 103–4
 insect treatment, 101
 insulation, 176
 International Standards, 59–60
 International Tropical Timber
 Organisation (ITTO), 42
 iroko, 139, 150
 Italian Wood, Furniture and
 Cork Association, 73
 Ivory Coast, 136
- joinery, 103, 120
Juglans nigra, 152
Juglans regia, 152–3
- kabukalli, 139–40
 kapur, 140
 keruing, 140–1
Khaya spp., 141
Klainedox gabonensis, 136
- landfill, 159–60
 larch, 117–18
Larix spp., 117–18
 Latvia, 14, 80
 legality certification, 52–3
 EUTR, 71–3
 FLEGT, 50–2
 United Kingdom, 67–8
 life cycle analysis, 171–2

- Liriodendron tulipifera*, 153–4
 logging, illegal, 33–5
Lophira alata, 136

 mahogany, 144
 African, 141
 American, 141–2
 majau, 143
 Malaysia, 140, 144
 timber certification, 62
 Voluntary Partnership Agreements, 51–2
 managed forests, 164–5
 broadleaved
 temperate, 16
 tropical, 17–18
 conifers, 12–16
 Latvia, 14
 replanting, 14–16
 Sweden, 13–14, 13
Manilkara spp., 143
 maple, 142–3
 massaranduba, 143
 meranti, 143–4
Milicia excelsa, 139
 missanda, 144–5
 moisture content, 100–1
 monitoring organisations, 72, 75
 Monkey puzzle, 88
 movement, 133–4
 movingui *see* ayan
 MTCS, 62
 mutual recognition, 59
 MYTLAS, 52

 National Measurement Office,
 72, 75
 natural durability, 100
Nauclea diderrichii, 147–8
 NEPCon, 73
 New Zealand, 46
 plantations, 20
 Nigeria, 138, 144–5
 non-native species, 19
 nurseries, 11–12

 oak, 6, 16
 American red, 145
 American white, 145–6
 obeche, 147
Ochroma spp., 23
Ocotea rodiaei, 137
 Ontario, 9–10
 opepe, 147–8
 outdoor timber, 104–5
 oxygen production, 29–30

 padauk, 148
 Patagonian cypress, 88
 PEFC *see* Programme for the
 Endorsement of Forest
 Certification
 Pernambuco, 88
 Peteã, 8–9
Picea abies, 20, 112–13
Picea sitchensis, 114
 pine, 8, 20, 110–12
 Elliottis, 48
 European redwood, 110–12
 Radiata, 48
 Southern, 119–20
 Yellow, 121
Pinus elliotti, 21, 48
Pinus radiata, 20
Pinus strobus, 121
Pinus sylvestris, 110–12
 pitch pine, 120
 plantations, 12, 18–24
 conifers, 20–1
 South America, 21
 plastics, 31–2
 plywood, 23, 48–9, 134
 polyvinyl chloride (PVC), 31
 power stations, 163
 preservatives, 101–2, 113
 Proforest, 53
 Programme for the
 Endorsement of
 Forest Certification
 (PEFC), 55–6, 57–60, 120
 FSC and, 97–9
 Proskills, 66
Prunus serotina, 134–5
Pterocarpus soyauxii, 148

Quercus spp., 145–6

- Radiata pine, 20, 21, 48
- Ramin, 88
- recycled timber, 96–7
- recycled wood, 158–9
- Red grandis, 23, 148–9
- Red sandalwood, 88
- redwood, European, 110–12
- replanting, 26–8
 - managed forests, 14–16
- resistant species, 102
- Responsible Purchasing Policy, 39, 40, 42–4, 74–5
- RPP *see* Responsible Purchasing Policy

- sapele, 149
- Save the Rainforest campaign, 35–6
- Scots pine *see* European redwood
- see also* Douglas fir
- SGS, 53–4
- Shorea* spp., 143, 143–4
- short rotation coppice, 95–6
- silver fir, 112–13
- Sistem Verifikasi Legalitas Kayu (SVLK), 51
- Sitka spruce, 20–1, 22
- slash and burn agriculture, 35
- softwoods, 3, 110–22
 - forests, 6
 - growth rates, 8–10
 - see also* conifers
- South America, 21
 - timber certification, 62
- Southern pine, 119–20
- species groups, 145–6
 - Douglas fir-larch, 122–3
 - hem-fir, 122
 - spruce-pine-fir, 121–2
- spruce, 8, 20–1, 112–13
 - Sitka, 20–1, 22, 114
- spruce-pine-fir species group, 121–2
- stability, 102
- standard organisations, 59–60
- sustainability, 5–6
 - building, 175–6
 - certification *see* Chain of Custody certification
 - costs, 176–8
 - definition, 25–6
 - UK Government, 67, 68
 - verification *see* chain of custody certification
- Sustainable Forest Initiative (SFI), 61, 120, 129, 135
- SVLK, 51
- Sweden
 - chain of custody certification, 58
 - managed forests, 13–14, 13
 - natural forests, 8–12
 - tree nurseries, 11–12, 11
- sweet chestnut, 135–6
- Swietenia macrophylla*, 141–2

- tali *see* missanda
- tatajuba, 150
- teak, 22, 150–1
- Tectona grandis*, 150–1
- temperate zone, 6
 - managed broadleaf forests, 16
- temperature, 8–10
- Thuja plicata*, 118–19
- tiamu *see* gedu nohor
- timber
 - applications, 28–9, 102–3
 - choice, 99
 - location, 99–100
 - colour, 105–6
 - consumption, 26–7
 - finishes, 103–5
 - materials properties, 5–6
 - moisture content, 100–1
 - preservatives, 101–2
 - quality from plantations, 20
 - recycled, 157–8
 - stability, 102
 - texture, 106–7
- timber exceptions, 94–6
- Timber Legality and Traceability Verification (TLTV), 53–4
- timber merchants, 93
- Timber Procurement Policy (TPP), 25–6, 61, 66, 91
 - compliance levels, 66
 - exceptions, recycled timber, 96–7
 - proof of compliance, 68–9

- Timber Trade Federation, 26, 37–40, 51
 - Responsible Purchasing Policy, 39, 40, 42–4, 74–5
- TLTV, 53–4
- TPP *see* Timber Procurement Policy
- Transparency International, 44–5
- tree growth, 1–3
- Triplochiton scleroxylon*, 147
- tropical forests, 17–18
 - managed, 16–18
- trunk, 1–2
- Tsuga heterophylla*, 114–15
- tulipwood, 153–4
- UKWAS, 59, 62
- United Kingdom
 - consumption, 26–8
 - Corruption Perception Index
 - ranking, 46
 - imported timber, 16
 - plantations, 21
 - sustainability definition, 67
 - Timber Procurement Policy, 25–6
 - see also* Timber Trade Federation
- United States
 - managed forests, broadleaf, 16
 - Sustainable Forestry Initiative, 61
- utile, 151–2
- veneers, 149
- Victoria State School of Forestry, 23
- Voluntary Partnership Agreements (VPA), 50–1, 78, 91
- walnut, 152
- Western hemlock, 114–15
- whitewood, American, 153–4
- wood *see* timber
- Wood for Good campaign, 26, 27, 37, 38
- wood preservatives, 113
- wood waste, 162
- woody stem, 1–2
- Yellow pine, 121